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NAS PENSACOLA
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SITE ASSESSMENT WORK PLAN FOR LIGHT NON-AQUEOUS PHASE LIQUID DELINEATION AND GROUNDWATER SAMPLING AT SHERMAN FIELD FORMER FUEL FARM UNDERGROUND STORAGE TANK SITE 24 NAS PENSACOLA FL

07/01/2008

CH2M HILL

Site Assessment Work Plan
LNAPL Delineation and Groundwater Sampling
at Sherman Field Former Fuel Farm
Underground Storage Tank Site 000024

Naval Air Station Pensacola
Pensacola, Florida

Revision No. 00

Contract No. N62467-01-D-0331
Contract Task Order No. 0085

Submitted to:

U.S. Naval Facilities
Engineering Command Southeast

Prepared by:

Northpark 400
1000 Abernathy Road
Suite 1600
Atlanta, GA 30328

July 2008

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CH2MHILL Constructors, Inc.

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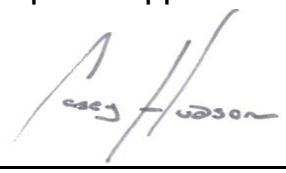
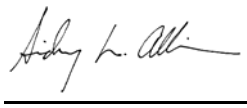
July 2008

Prepared/Approved By:



Casey Hudson, Project Manager — July 22, 2008 (Date)

Approved By:



Sidney Alison, Program Manager — July 22, 2008 (Date)

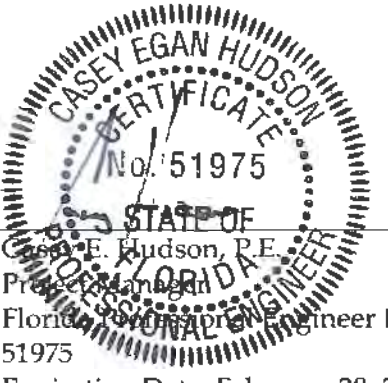
Client Acceptance:

U.S. Navy Responsible Authority — Date

PROFESSIONAL CERTIFICATION

The contractor, CH2M HILL Constructors, Inc., hereby certifies that, to the best of its knowledge and belief, this Site Assessment Work Plan and the technical data, delivered herewith under Contract No. N62467-01-D-0331, Contract Task Order No. 0085 is complete and accurate and complies with all requirements of this contract and standard professional practices at the time the submittal was prepared. This document was prepared under the supervision of the signing Professional Engineer and is partly based on information obtained from others. If conditions are determined to exist differently than those described in this document, then the undersigned Professional Engineer should be notified to evaluate the effects of any additional information on the project described in this document.

DATE: July 23, 2008



NAME AND TITLE OF CERTIFYING OFFICIAL: Casey E. Hudson, P.E.
Project Manager
Florida Professional Engineer Number: 51975
Expiration Date: February 28, 2009

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Acronyms and Abbreviations

AFCEE	Air Force Center for Engineering and the Environment
AHA	Activity Hazard Analysis
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, xylenes
CFR	Code of Federal Regulations
CH2M HILL	CH2M HILL Constructors, Inc.
CO	Contracting Officer
CTO	Contract Task Order
DO	dissolved oxygen
DOT	Department of Transportation
EDB	ethylene dibromide or 1,2-dibromoethane
EPA	U.S. Environmental Protection Agency
FDEP	Florida Department of Environmental Protection
FL-PRO	Florida Petroleum Residual Organic
GCTLs	groundwater cleanup target levels
H_2SO_4	sulfuric acid
HCl	hydrochloric acid
HDPE	high density polyethylene
HSP	Health and Safety Plan
IRCDQM	Installation Restoration Chemical Data Quality Manual
L/min	liters per minute
LNAPL	light non-aqueous phase liquid
µg/L	micrograms per liter
mL	milliliters
MNA	monitored natural attenuation
MS/MSD	matrix spike/matrix spike duplicate
msl	mean sea level
MTBE	methyl tertiary butyl ether
NADC	Natural Attenuation Default Concentration
NAS	Naval Air Station
NAVFAC SE	Naval Facilities Engineering Command Southeast
ORP	oxidation-reduction potential
PAHs	polycyclic aromatic hydrocarbons
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
RAP	Remedial Action Plan
RPM	Remedial Project Manager
ROICC	Resident Officer in Charge of Construction
SA WP	Site Assessment Work Plan
SAP	Sampling and Analysis Plan
SOP	standard operating procedure

TOC	total organic carbon
TPH	total petroleum hydrocarbon
TtNUS	Tetra Tech NUS, Inc.
USACE	U.S. Army Corps of Engineers
UST	underground storage tank
VOA	volatile organic analysis
VOC	volatile organic compound

1.0 Introduction

CH2M HILL Constructors, Inc. (CH2M HILL) has been contracted by Naval Facilities Engineering Command Southeast (NAVFAC SE), to prepare this Site Assessment Work Plan (SA WP) under Response Action Contract No. N62467-01-D-0331, Contract Task Order (CTO) No. 0085. The purpose of this SA WP is to outline the procedures to perform light non-aqueous phase liquid (LNAPL) gauging and groundwater sampling at monitoring wells located at the Sherman Field Former Fuel Farm, Underground Storage Tank (UST) Site 000024, Naval Air Station (NAS) Pensacola, Pensacola, Florida. The purpose of this work is to collect data to evaluate current conditions at the site.

The scope of work described in this SA WP includes verification of existing onsite monitoring wells, collection of groundwater level and LNAPL thickness (if present) measurements from these wells, and collection of groundwater samples from select wells.

This SA WP is organized into six sections and four appendices as follows:

- **Section 1.0 Introduction** includes the site history and project objectives.
- **Section 2.0 Project Execution Plan** details the scope of work, project schedule, communications plan, traffic control plan, and environmental protection plan. The NAS Pensacola Basewide Work Plan (CH2M HILL, 2000) provides a brief description of the reporting requirements under this contract.
- **Section 3.0 Sampling and Analysis Plan (SAP).** This section details the sampling procedures that will be followed during execution of the work scope described in Section 2.0. Topics such as sampling methodology, sample collection frequency, laboratory analytical methods, and quality assurance (QA)/quality control (QC) sampling are discussed. The test methodology presented in Section 3.0 conforms to the standards promulgated by the Florida Department of Environmental Protection (FDEP) and U.S. Environmental Protection Agency (EPA).
- **Section 4.0 Waste Management Plan.** This section presents waste management practices that will be maintained during assessment and disposal of purge and decontamination water collected during monitoring well sampling activities.
- **Section 5.0 Quality Control Plan** includes the testing requirements for work described in this SA WP. The site-specific project organization for this CTO is also included in this section.
- **Section 6.0 References** lists reference documents cited in the SA WP.
- **Appendix A** contains the Groundwater Monitoring Well Gauging Form.
- **Appendix B** contains the site-specific Health and Safety Plan (HSP).
- **Appendix C** contains the Submittal Register and Testing Plan and Log.
- **Appendix D** contains the appointment letter for the Project QC Manager.

1.1 Site Description and History

NAS Pensacola is located in northwest Florida on the western side of Pensacola Bay, approximately 2 miles south of Pensacola, Florida, on Navy Boulevard. The site is located on the western perimeter of the base, approximately 2400 feet north of Radford Boulevard (see Figure 1-1). The Sherman Field Former Fuel Farm, UST Site 000024, is an approximately 3.5-acre fenced area including four cut-and-cover storage tanks (Tank Numbers 1884, 1886, 1887, and 1888) (see Figure 1-2). The petroleum storage tank system was installed circa 1945 and was used to store JP-4 jet fuel. An equipment malfunction led to a release of 48,000 gallons of JP-4 in 1983. NAS Pensacola personnel initially installed four recovery ditches and recovered approximately 600 to 700 gallons of product. Shortly thereafter, use of the recovery ditches was discontinued by direction of the NAS Pensacola Fire Marshall. In August 1983, a product/groundwater recovery well system was installed. The recovery system proved ineffective and recovery efforts were discontinued (Tetra Tech NUS, Inc. [TtNUS], 2002a). The fuel storage tanks were abandoned in place in 1995 when a new fuel facility was constructed adjacent to the south of the original fuel farm.

1.2 Site History

Based on a site assessment performed by TtNUS in 2000, the former USTs at the Sherman Field Former Fuel Farm were installed upon a flat cut base and then covered with fill (TtNUS, 2002b). Typical site lithology is yellowish brown to light brown to white, silty, fine- to medium-grained sand at normal land surface and below the tank mound to approximately 38 feet below ground surface (bgs). Discontinuous 1-foot thick layers of peat at 38 feet bgs and below were the only potentially confining layers encountered during the site assessment investigation.

Depths to groundwater ranged from 7.5 to 28.3 feet bgs in shallow wells at the site, reflecting the difference in elevation of wells installed in the mound covering the tanks and those installed off the mound. Water table elevation ranged from 18 to 22 feet above mean sea level (msl). Groundwater flow in the shallow aquifer is generally to the south-southeast; however, it is localized in a radial pattern near the tank mound.

In 2000, 50 wells were gauged for LNAPL thickness. LNAPL thickness measurements recorded at the site in 2000 are included with well locations on Figure 1-3. LNAPL measurements ranged from a visible sheen (MW2-S, MW3-S, and MW16-S) to 1.64 feet (MW-1) in thickness. Seven of the monitoring wells at the site contained measurable LNAPL thickness (TtNUS, 2002b).

Site assessment data indicated contaminated soil was generally limited to the vicinity of the former fuel tanks, dissolved petroleum contaminants exceeded FDEP groundwater cleanup target levels (GCTLs) in site groundwater, and LNAPL was present in existing site monitoring wells. The Site Assessment Report recommended a Remedial Action Plan (RAP) to address the LNAPL (TtNUs, 2002b).

Sherman Field Former Fuel Farm

NAS Pensacola Installation Area

N

0 0.25 0.5 1 Mile

FIGURE 1-1
Site Location
Sherman Field Former Fuel Farm, Naval Air Station Pensacola
Pensacola, Florida

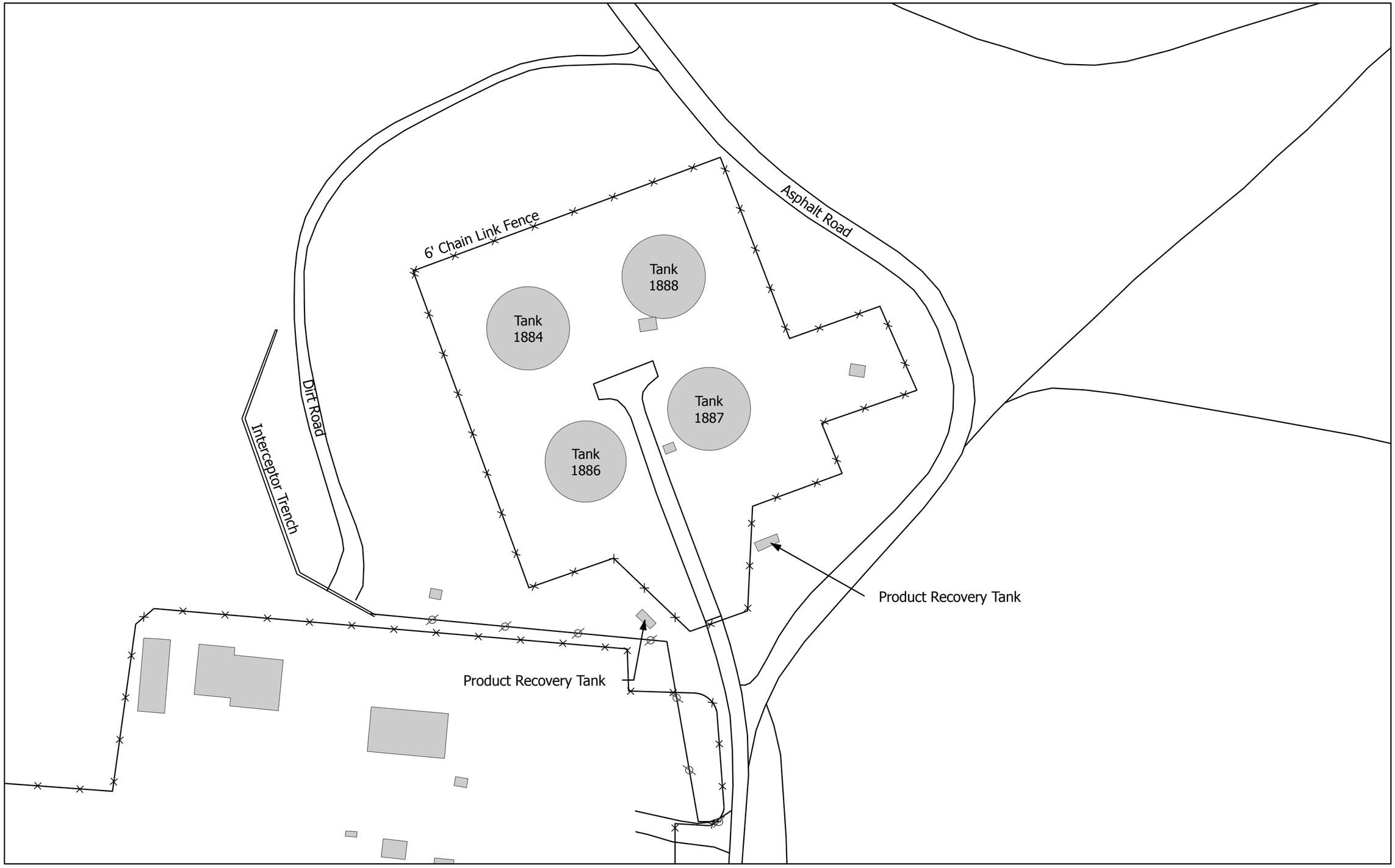
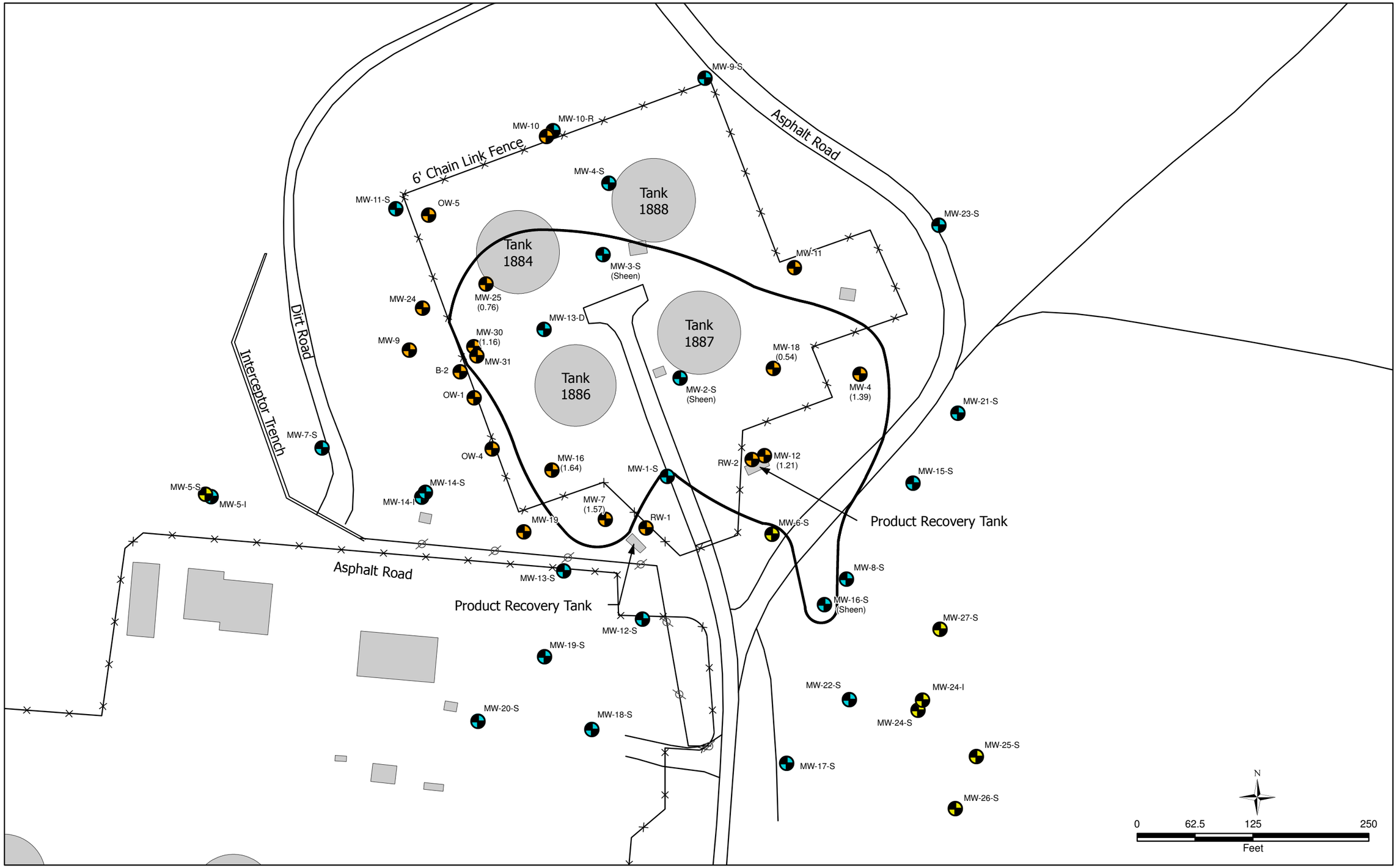


FIGURE 1-2
Site Plan
Sherman Field Former Fuel Farm, Naval Air Station Pensacola
Pensacola, Florida



Monitoring Wells in NAS Pensacola GIS and Installed During Site Assessment (TETRA TECH NUS, INC., July 2002)

Monitoring Wells Not in NAS Pensacola GIS But Logs Available in the Site Assessment Report (TETRA TECH NUS, INC., July 2002)

Monitoring Wells Not in NAS Pensacola GIS and Installed Prior to Site Assessment (TETRA TECH NUS, INC., July 2002)

*Note: All groundwater monitoring well station identifications have a prefix of "NASPFF"

Overhead Power Line

Fence Line

Interpreted Extent of LNAPL and (1.21) Approximate LNAPL Thickness

FIGURE 1-3
Measured LNAPL Thickness - July/September 2000
Sherman Field Former Fuel Farm, Naval Air Station Pensacola
Pensacola, Florida

A RAP was completed for the Sherman Field Former Fuel Farm (TtNUs, 2002a). The remedial action goal for the site was to remove LNAPL in excess of 0.01 foot. The RAP recommendation for treatment of hydrocarbons in the vadose zone and recovery of LNAPL was a bioslurping pilot study for full-scale implementation (TtNUS, 2002a).

1.3 Project Objective

The objective of this SA WP is to provide methods for data collection to evaluate the current extent of LNAPL and the magnitude of groundwater contamination at Sherman Field Former Fuel Farm. Project tasks include; 1) verifying the existing monitoring well network at the Sherman Field Former Fuel Farm, 2) collecting groundwater elevation and LNAPL, if present, measurements from each well, and 3) groundwater sampling of select monitoring wells. Data will be used to evaluate whether the RAP completed in 2002 is still appropriate or a RAP Addendum is needed to change or modify the proposed remedial action alternative for LNAPL recovery.

2.0 Project Execution Plan

The scope of work, project schedule, communications plan, and traffic control plan are described in this section.

2.1 Scope of Work

The activities associated with the scope of work outlined in this SA WP are as follows:

- Mobilization and Site Preparation
- Well Verification and Groundwater Elevation and LNAPL Survey
- Groundwater Sampling
- Decontamination and Demobilization
- Technical Memorandum Documenting LNAPL Gauging and Groundwater Sampling

2.1.1 Mobilization and Site Preparation

This task includes the mobilization of required resources (personnel, equipment, materials, supplies, and support facilities) to the work site to efficiently and completely perform the tasks.

CH2M HILL will coordinate with NAS Pensacola Facilities and Engineering Division and the Resident Officer in Charge of Construction (ROICC) to obtain access to the site.

2.1.2 Well Verification and Groundwater Elevation and LNAPL Survey

Groundwater monitoring wells will be verified in the field prior to gauging. The list of wells presented in Table 2-1 is separated into four categories based on the data source used to compile the list.

Groundwater levels and LNAPL thickness will be measured in monitoring wells located at the Sherman Field Former Fuel Farm using an electronic oil/water interface probe. The tape or sounding wire for the interface probe or water level indicator will be marked in increments of 0.010 foot. The measurements will be recorded on the groundwater monitoring well gauging form (see Appendix A). Well locations are shown on Figure 1-3. Damaged wells or wells that cannot be located (wells were last gauged in 2002) will be noted on the well gauging form.

TABLE 2-1
Monitoring Well Summary
Sherman Field Former Fuel Farm, NAS Pensacola, Florida

Well ID	Top of Casing Elevation (feet msl)	Total Depth (feet bgs)	Screened Interval (feet bgs)
Wells in GIS and Installed During Site Assessment			
MW1-S	40.01	24.65	14.5-24.5
MW2-S	43.95	29.45	18.5-28.5
MW3-S	45.65	29.45	19.0-29.0
MW4-S	44.88	29.70	19.0-29.0
MW5-I	31.65	39.30	34.0-39.0
MW7-S	28.83	16.70	6.2-16.2
MW8-S	31.47	18.27	7.5-17.5
MW9-S	29.24	16.65	6.0-16.0
MW10-R	29.85	18.50	8.0-18.0
MW11-S	27.99	16.50	6.0-16.0
MW12-S	33.47	19.70	9.2-19.2
MW13-D	45.01	76.83	71.33-76.33
MW13-S	36.24	18.80	8.3-18.3
MW14-I	32.27	40.00	34.0-39.0
MW14-S	31.47	18.25	7.5-17.5
MW15-S	30.62	18.20	7.5-17.5
MW16-S	31.62	18.10	7.5-17.5
MW17-S	34.28	19.40	8.9-18.9
MW18-S	32.29	19.55	9.0-19.0
MW19-S	35.87	19.20	9.0-19.0
MW20-S	36.13	19.40	9.0-19.0
MW21-S	28.83	18.15	7.5-17.5
MW22-S	33.01	20.35	9.85-19.85
MW23-S	29.59	15.30	4.5-14.5
Wells Not in GIS But Well Logs in Site Assessment Report			
MW5-S	31.86	18.60	7.5-17.5
MW6-S	30.67	18.00	7.5-17.5
MW24-I	34.65	43.16	38.16-43.16
MW24-S	34.72	23.02	13.02-23.02
MW25-S	34.04	23.66	13.55-23.66
MW26-S	31.14	23.49	13.49-23.49
MW27-S	33.55	23.30	13.30-23.30
Wells Not in GIS And Installed Prior to Site Assessment			
MW-4	31.21	NA	NA
MW-7	33.99	NA	NA
MW-9	30.03	NA	NA
MW-11	31.10	NA	NA
MW-12	32.37	NA	NA
MW-16	37.43	NA	NA
MW-18	43.77	NA	NA
MW-19	35.38	NA	NA
MW-24	30.75	NA	NA
MW-25	31.21	NA	NA
MW-30	33.88	NA	NA
MW-31	32.69	NA	NA
OW-4	30.05	NA	NA
Wells Not in GIS And No Construction Information in Site Assessment Report			
MW-10	NA	NA	NA
B-2	NA	NA	NA
OW-1	NA	NA	NA
OW-5	NA	NA	NA
RW-1	NA	NA	NA
RW-2	NA	NA	NA

msl – mean sea level
bgs – below ground surface
NA – information not available

Groundwater levels and LNAPL thickness will be measured using the following procedure:

1. Decontaminate the oil/water interface probe or water level indicator.
2. Unlock and uncap the observation/recovery/monitoring well, locate the reference mark on the top of the well casing, and record the well number, date. Allow the product/water level in the well to stabilize prior to collecting measurements.
3. Lower the probe into the well until contact is made with product or water.
4. If LNAPL is detected, record the depth to product to the nearest 0.010 foot. Continue to lower the probe until water is detected and record the depth to water to the nearest 0.010 foot. Continue to lower the probe to the bottom of the well and record the total well depth to the nearest 0.010 foot. Subtract the depth to product from the depth to water to determine the product thickness.
5. If water is detected, record the depth to water to the nearest 0.010 foot. Continue to lower the probe to the bottom of the well and record the total well depth to the nearest 0.010 foot.

All information will be recorded on the Groundwater Monitoring Well Gauging Form (Appendix A).

2.1.3 Groundwater Sampling

The primary objective of groundwater sampling is to evaluate the magnitude and preliminary extent of dissolved hydrocarbons. Groundwater samples collected during the two most recent monitoring events completed in November 2000 and October/November 2001 were analyzed for the analytes that comprise the gasoline and kerosene analytical groups, as specified in Chapter 62-770 of the Florida Administrative Code (TtNUS, 2002a). Detected concentrations of benzene, ethylbenzene, xylene, 1- and 2-methylnaphthalene, naphthalene, and total petroleum hydrocarbons exceeded GCTLs (TtNUS, 2002a).

During the November 2000 monitoring event, methylene chloride was detected at a concentration of 13J micrograms per liter (µg/L) in MW16-S, which exceeds the GCTL of 5 µg/L. In addition, chloroform was detected during the same monitoring event at a concentration of 6.6 µg/L in MW14-S, which slightly exceeds the GCTL of 5.7 µg/L. Neither constituent exceeded the GCTLs in the samples collected during the October/November 2001 event. During the November 2000 and October/November 2001 monitoring events, lead was detected in five and six wells, respectively, with no results exceeding the GCTL of 15 µg/L. In addition, methyl tertiary butyl ether (MTBE) was detected during the November 2000 and the October/November monitoring events in deep monitoring well MW-13D at concentrations of 5.1J µg/L and at 4.6 µg/L, respectively; both of these concentrations are below the GCTL of 50 µg/L. Ethylene dibromide (EDB) was not detected during either of the two monitoring events (TtNUS, 2002a).

In the RAP, which outlines the proposed remedy to address petroleum-impacted soil and to remove LNAPL, semi-annual groundwater monitoring for analytes included in the gasoline and kerosene analytical group is recommended during remedy implementation (TtNUS, 2002b). Due to the frequency of detection, some of these analytes will be omitted or limited to a few wells in the proposed sampling strategy.

Water quality data collected from the groundwater sampling event will be compared to the GCTL and FDEP Natural Attenuation Default Concentration (NADC) criteria to evaluate if an active remedial action is necessary to reduce hydrocarbons in groundwater. In addition, groundwater samples will be collected to evaluate whether conditions are favorable for natural attenuation.

Groundwater samples will be collected from 12 wells and analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX), 16 method listed polycyclic aromatic hydrocarbons (PAHs) including 1-and 2-methylnaphthalene and naphthalene by EPA Method 8270C, and total petroleum hydrocarbons (TPH) by the Florida Petroleum Residual Organic (FL-PRO) Method. The wells were selected based on previous measurements of LNAPL and groundwater flow direction, with downgradient wells and wells with detected concentrations of petroleum hydrocarbons preferred.

Two wells that historically had detected lead concentrations (MW16-S and MW22-S) were selected for lead analysis. In addition, two wells that historically had detected concentrations of 1,2-dichloroethane (MW1-S and MW22-S) were selected for 1,2-dichloroethane analysis and the other priority pollutant volatile organic hydrocarbons by EPA Method 8260B. Due to infrequency of detection, MTBE and EDB were not included in the recommended parameter list. Table 2-2 presents a list of the wells selected for groundwater sampling. Figure 1-3 depicts these well locations.

TABLE 2-2
Groundwater Sampling Network
Sherman Field Former Fuel Farm, NAS Pensacola, Florida

Well ID	Top of Casing Elevation (feet msl)	Total Depth (feet bgs)	Screened Internal (feet bgs)	Proposed Groundwater Sample Analyses
MW1-S	40.01	24.65	14.5-24.5	BTEX, 16 method listed PAHs, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, TPH, 1-2-dichloroethane and other Priority Pollutant Volatile Organic Halocarbons, Natural Attenuation Parameters
MW2-S	43.95	29.45	18.5-28.5	BTEX, 16 method listed PAHs, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, TPH
MW3-S	45.65	29.45	19.0-29.0	BTEX, 16 method listed PAHs, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, TPH, Natural Attenuation Parameters
MW4-S	44.88	29.70	19.0-29.0	BTEX, 16 method listed PAHs, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, TPH, Natural Attenuation Parameters
MW11-S	27.99	16.50	6.0-16.0	BTEX, 16 method listed PAHs, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, TPH
MW12-S	33.47	19.70	9.2-19.2	BTEX, 16 method listed PAHs, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, TPH
MW14-S	31.47	18.25	7.5-17.5	BTEX, 16 method listed PAHs, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, TPH, Natural Attenuation Parameters
MW15-S	30.62	18.20	7.5-17.5	BTEX, 16 method listed PAHs, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, TPH
MW16-S	31.62	18.10	7.5.17.5	BTEX, 16 method listed PAHs, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, TPH, lead, Natural Attenuation Parameters
MW17-S	34.28	19.40	8.9-18.9	BTEX, 16 method listed PAHs, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, TPH

TABLE 2-2
Groundwater Sampling Network
Sherman Field Former Fuel Farm, NAS Pensacola, Florida

Well ID	Top of Casing Elevation (feet msl)	Total Depth (feet bgs)	Screened Internal (feet bgs)	Proposed Groundwater Sample Analyses
MW18-S	32.29	19.55	9.0-19.0	BTEX, 16 method listed PAHs, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, TPH
MW22-S	33.01	20.35	9.85-19.85	BTEX, 16 method listed PAHs, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, TPH, lead, 1-2-dichloroethane and other Priority Pollutant Volatile Organic Halocarbons

msl – above mean sea level
bgs – below ground surface
BTEX – benzene, toluene, ethylbenzene, xylenes
PAHs – polycyclic aromatic hydrocarbons
TPH – total petroleum hydrocarbons
Natural Attenuation Parameters – Sulfate, Sulfide, Methane, Alkalinity, total organic carbon (TOC), Ferrous Iron

Groundwater samples from 5 of the 12 wells will also be analyzed for the following monitored natural attenuation (MNA) parameters: sulfate/sulfide, alkalinity, methane, total organic carbon, and ferrous iron. All parameters will be analyzed by a fixed laboratory with the exception of ferrous iron, sulfide, and alkalinity, which will be analyzed in the field. Data from the five wells will be representative of site geochemistry and will be used to evaluate the aquifer's ability to attenuate petroleum hydrocarbons. The five wells were selected based on their spatial relationship. One well (MW-4S) is located upgradient of the historical LNAPL plume. Two wells (MW-1S, MW-3S) are located within the former plume, and two wells (MW-14S, MW-16S) are located downgradient of the former plume. During sampling of all wells, field measurements of dissolved oxygen (DO), oxidation-reduction potential (ORP), temperature, pH, and conductivity will be recorded.

2.1.4 Decontamination and Demobilization

Gauging and sampling equipment will be properly decontaminated between each well and prior to demobilization. Any water accumulated during the decontamination process will be containerized in 55-gallon drums, sampled in accordance with Section 3.0 Sampling and Analysis Plan, and managed, transported, and disposed in accordance with Section 4.0 Waste Management Plan. Decontamination of personnel and equipment will be performed in accordance with the HSP provided in Appendix B and the applicable provisions of 29 Code of Federal Regulations (CFR) 1910.120.

During demobilization, equipment will be removed from the site. In addition, any debris or solid waste material remaining from gauging and sampling activities will be removed and properly disposed of offsite in accordance with Section 4.0 Waste Management Plan of this SA WP.

2.1.5 LNAPL Gauging and Groundwater Sampling Technical Memorandum

Information obtained from the groundwater elevation and LNAPL gauging and the groundwater sampling will be summarized in a technical memorandum. CH2M HILL will use this information to evaluate whether the RAP completed in 2002 is still applicable or if a

RAP Addendum is necessary to change or modify the proposed Remedial Action for LNAPL recovery.

2.2 Project Schedule

The primary project activities and estimated durations for each are specified below:

- Mobilization 1 Day
- Well Verification and Groundwater and LNAPL Gauging 1 Day
- Groundwater Sampling 2 Days
- Demobilization 1 Day

2.3 Communications Plan

A communication matrix outlining the lines of communications for NAVFAC SE and CH2M HILL is presented in Table 2-3. Table 2-4 provides a project personnel directory.

TABLE 2-3
Communications Matrix
Sherman Field Former Fuel Farm, NAS Pensacola, Florida

CH2M HILL Position	Navy Direct Report
Ray Tyler, Executive Sponsor	
Sidney Alison, Program Manager	Richard Stanley, CO
Casey Hudson, CTO Project Manager	Dorothy Okamoto, COTR Richard Stanley, CO Patty Marajh-Whittemore, RPM Mark Shull, ROICC

CO – Contracting Officer
RPM – Remedial Project Manager
COTR – Contracting Officer's Technical Representative

TABLE 2-4
Project Personnel Directory
Sherman Field Former Fuel Farm, NAS Pensacola, Florida

Contact	Company
Sidney Alison, Program Manager Robert Hess, Contracts Administration Manager Casey Hudson, CTO Project Manger Theresa Rojas, Quality Manager	CH2M HILL Constructors, Inc 400 Northpark 1000 Abernathy Road Suite 1600 Atlanta, GA 30328 770/604-9095
Richard Rathnow, Health and Safety Manager	CH2M HILL Constructors, Inc. 2035 Lakeside Centre Way Suite 200 Knoxville, TN 37922 865/483-9005
Phyllis Zerangue, Project QC Manager	CH2M HILL, Inc. 1766 Sea Lark Lane Navarre, FL32566-7472 850/939-8300

TABLE 2-4
Project Personnel Directory
Sherman Field Former Fuel Farm, NAS Pensacola, Florida

Contact	Company
Richard Stanley, CO	NAVFAC SE P.O. Box 190010 North Charleston, SC 29419-9010 843/820-5939
Dorothy Okamoto, COTR	As above 843/820-5940
Patty Marajh-Whittemore, RPM	NAVFAC SE IPT, Gulf Coast Building 103 NAS Jacksonville FL 32212-0300 904/542-3991 ext.4566
Mark Shull, ROICC	NAS Pensacola 310 John Tower Rd. Pensacola, FL 32508-5000 850/452-3131 ext 3082

2.4 Traffic Control Plan

Traffic control will be the responsibility of the onsite CH2M HILL representative. CH2M HILL will minimize disturbance to NAS Pensacola traffic patterns during project activities. CH2M HILL will consult with onsite personnel to evaluate site access and traffic flow to minimize the impact of this work to NAS Pensacola.

2.5 Environmental Protection Plan

All purge and decontamination water will be properly contained in a designated containment area. The general provisions of the Environmental Protection Plan provided in the NAS Pensacola Basewide Work Plan (CH2M HILL, 2000) will be adhered to during the performance of the work.

3.0 Sampling and Analysis Plan

This SAP describes CH2M HILL's tasks and responsibilities related to sampling and analysis activities associated with the work effort. CH2M HILL intends this document to be a site-specific guide for use by the field team while performing the project-required sampling and analysis. Any changes to the activities described in this SAP must be documented as an addendum or revision to this SAP and approved by the Project Manager and Project Chemist.

Samples will be collected in accordance with the EPA Region IV, Science and Ecosystem Support Division, Field Branches Quality System and Technical Procedures (EPA, 2007) and FDEP standard operating procedures (SOPs) for Field Activities, DEP-SOP-001/01, February 1, 2004. Where the two documents conflict, the more stringent will apply.

The sampling team will be qualified under the Navy Installation Restoration Chemical Data Quality Manual (IRCDQM), 1999 sampling requirements.

A Navy, U.S. Army Corps of Engineers (USACE)-, or Air Force Center for Engineering and the Environment (AFCEE)- and FDEP-approved laboratory will be used for all sample analyses.

3.1 Data Quality Levels for Measurement Data

The data quality levels for each sampling task are listed in Table 3-1. The sampling events, sampling and analytical requirements, and the required level of quality and data packages are listed in Table 3-2. The quantization, project action, accuracy, precision, and completeness limits by which the data will be evaluated will be provided by the selected laboratory and approved by CH2M HILL's Project Chemist.

TABLE 3-1
Data Quality Levels
Sherman Field Former Fuel Farm, NAS Pensacola, Florida

Sampling Activity	Data Quality Level Category
Groundwater Sampling (field analyses)	Screening
Groundwater Sampling (offsite laboratory analyses)	Definitive
Waste Characterization of Liquid Waste (offsite laboratory analyses)	Definitive

TABLE 3-2
Sampling and Analysis Summary
Sherman Field Former Fuel Farm, Naval Air Station Pensacola
Pensacola, Florida

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	Turn Around Time	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
Groundwater Sampling													
Groundwater Sampling	Monitoring Wells MW1-S, MW2-S MW3-S, MW4-S MW11-S, MW12-S MW14-S, MW15-S MW16-S, MW17-S MW18-S, MW22-S	Water	One-time	12 + 2 DUP + 1 MS/MSD = 15	Grab	Peristaltic Pump, Flow-Through Cell, Tubing	14 days	CH2M HILL Level C	BTEX and naphthalene	8260B	14 days	HCl pH< 2; Cool to 4°C	(3) 40 mL vials
									PAHs (16 method listed **plus** 1-Methylnaphthalene & 2-Methylnaphthalene)	8270SIM	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
									TPH	FL-PRO	7 days ext; 40-days analysis	HCl pH< 2; Cool to 4°C	(2) 1-L amber glass
	MW16-S MW22-S	Water	One-time	2	Grab	Tubing	14 days	CH2M HILL Level C	Lead	6010B	180 days	HNO3, pH<2 Cool to 4 °C	(1) 500 mL HDPE
	MW1-S MW22-S	Water	One-time	2 + 1 DUP + 1 MS/MSD = 4	Grab	Peristaltic Pump, Flow-Through Cell, Tubing	14 days	CH2M HILL Level C	1-2-dichloroethane and Priority Pollutant Volatile Organic Hydrocarbons	8260B	14 days	HCl pH< 2; Cool to 4°C	(3) 40 mL vials
	MW1-S, MW2-S MW3-S, MW4-S MW11-S, MW12-S MW14-S, MW15-S MW16-S, MW17-S MW18-S, MW22-S	Water	One-time	12	Grab	Peristaltic Pump, Flow-Through Cell, Tubing	ASAP	Screening	DO, pH, conductivity, temperature, ORP	Direct Read Meter	ASAP	N/A	N/A
	MW1-S, MW3-S MW4-S, MW14-S MW16-S	Water	One-time	5 + 1 DUP + 1 MS/MSD = 8	Grab	Peristaltic Pump, Flow-Through Cell, Tubing	14 days	CH2M HILL Level C	Sulfate	300.0	28 days	Cool to 4°C	(1) 125-mL plastic
									TOC	415.1	28 days	Cool to 4°C, pH<2 w/HCl or H2SO4	(2) 40 mL vials
									Methane	RSK-175	14 days	HCl, pH<2 Cool to 4 °C	(2) 40 mL vials
				5	Grab	Peristaltic Pump, Flow-Through Cell, Tubing	ASAP	Screening	Ferrous Iron, Alkalinity, Sulfide	Direct Read Meter	ASAP	N/A	N/A
	Equipment Rinsate Blank	Water	1 per 10% of sampling	1	Prepared in Field	Analyte-free water, SS funnel	14 days	CH2M HILL Level C	BTEX, MTBE, and naphthalene, Priority Pollutant Volatile Organic Hydrocarbons	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 mL vials
									PAHs (16 method listed **plus** 1-Methylnaphthalene & 2-Methylnaphthalene)	8270SIM	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
									Lead	6010B	180 days	HNO3, pH<2 Cool to 4 °C	(1) 500 mL HDPE
									TPH	FL-PRO	7 days ext; 40-days analysis	HCl pH< 2; Cool to 4°C	(2) 1-L amber glass
									Sulfate	300.0	28 days	Cool to 4°C	(1) 125-mL plastic
									TOC	415.1	28 days	Cool to 4°C, pH<2 w/HCl or H2SO4	(2) 40-mL vials
									Methane	RSK-175	14 days	HCl, pH<2 Cool to 4 °C	(2) 40-mL vials
							ASAP	Screening	Ferrous Iron, Alkalinity, Sulfide	Direct Read Meter	ASAP	N/A	N/A
	Trip Blank	Water	1 per cooler containing volatile samples	1	Prepared by Lab	N/A	14 days	CH2M HILL Level C	BTEX and naphthalene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 mL vials

TABLE 3-2
Sampling and Analysis Summary
Sherman Field Former Fuel Farm, Naval Air Station Pensacola
Pensacola, Florida

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	Turn Around Time	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
Waste Characterization Sampling													
Disposal of Liquid Waste from Well Sampling Purge Water	55-gallon drums containing liquid waste	Water	One	1	Grab	Drum Thief or Dip Jar	7 days	CH2M HILL Level B	TCL Volatiles	8260B	14 days	HCl pH< 2; Cool to 4°C	(3) 40 ml vial
									TCL Semi-volatiles	8270C	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
									TCL Pesticides	8081A	7 days ext; 40-days analysis		(2) 1-L amber glass
									Herbicides	8151A	7 days ext; 40-days analysis		(2) 1-L amber glass
									PCBs	8082	7 days ext; 40-days analysis		(2) 1-L amber glass
									TAL Metals	6010B/7470 A	180 days; Hg = 28 days	HNO_3 pH< 2; Cool to 4°C	(1) 500ml HDPE
									Ignitability	1010/1020A	ASAP	Cool to 4°C	(1) 500ml HDPE
									Corrosivity	9040B	ASAP		

TAL – Target Analyte List
TCL – Target Compound List
TCLP – Toxicity Compound Leaching Procedure
PCBs – polychlorinated biphenyls
BTEX – benzene, toluene, ethylbenzene, and xylenes
H_2SO_4 – sulfuric acid
MS/MSD – matrix spike/matrix spike duplicate

3.2 Sampling Objectives

The sampling objectives for this project will be as follows:

- Collect 12 groundwater samples for the analysis of BTEX, naphthalene, PAHs (16 PAH including both 1-methylnaphthalene and 2-methylnaphthalene) by EPA Method 8270C, and TPH by the FL-PRO Method.
- Collect two groundwater samples for the analysis of lead by Method 6010B.
- Collect two groundwater samples for 1,2-dichloroethane and priority pollutant volatile organic hydrocarbons by EPA Method 8260B
- Collect groundwater samples from five of the 12 wells for the following MNA parameters: sulfate/sulfide, alkalinity, total organic carbon (TOC), methane, and ferrous iron.
- Collect water sample for waste characterization of purge and decontamination water accumulated by sampling activities.

3.3 Groundwater Sampling Methodology

Groundwater samples will be collected following the EPA Region IV procedures for low-flow sampling (EPA, 2007). A summary of these procedures are as follows:

1. Slowly lower the decontaminated pump or pump intake to the middle of the screened interval to minimize excessive mixing of the stagnant water in the casing above the screen with water within screened zone, and to minimize re-suspension of solids that may have accumulated at the bottom of the well.
2. Once the pump is positioned in the well, an airtight flow-through cell (equipped with a YSI-type water quality meter) will be connected to the water discharge line.
3. A water level meter will than be lowered in to the well to monitor changes in water level during pumping. Once purging begins, water level measurements will be monitored, and pumping rates will be adjusted so the rate is between 0.1 to 0.3 liter per minute (L/min) to maintain minimal drawdown.
4. While purging, field parameters (DO, pH, temperature, conductivity, turbidity, and ORP) will be measured every 3 to 5 minutes using a YSI-type meter, and will be recorded until all parameters have stabilized for three consecutive readings. Once field parameter stabilization is achieved, samples will be field analyzed for ferrous iron, sulfate, and alkalinity, and sample bottles will be filled for laboratory analysis.
5. Water samples will be collected by directing the groundwater discharge stream from the pump so that it runs down the inside of the sample bottle with a minimum amount of splashing. To minimize volatile organic compound (VOC) loss, samples to be analyzed for volatile compounds will be collected using the soda straw method. Groundwater will be collected through the tubing for PAHs, TPH, sulfide, TOC, and lead. The sample bottles for each analysis are as follows:

- BTEX, naphthalene, and priority pollutant volatile organic hydrocarbons by EPA Method 8260B: Three 40-milliliter volatile organic analysis (VOA) vials containing a hydrochloric acid (HCl) preservative. Fill bottles so there is no headspace within the bottles.
- PAHs by EPA Method 8270: Two 1-liter amber jars. Fill to the top of the jar.
- TPH by the FL-PRO Method: Two 1-liter amber jars. Fill to the top of the jar.
- Sulfate by EPA Method 300.0: One 125-mL bottle jar. Fill to the top of the jar.
- Methane by RSK-176: Two 40-mL VOA vials containing HCl preservative. Fill bottles so there is no headspace within the bottles.
- TOC by EPA Method 415.1: Two 40-ml VOA vials or amber glass bottle containing either HCl or H_2SO_4 preservative. Fill to the top of the bottle.
- Lead by EPA Method 6010B: One 500-mL high density polyethylene (HDPE) plastic jar with HNO_3 preservative. Fill to the top of the bottle.

6. Cap each bottle and affix label to the bottle. Label information will include laboratory, project name and number, sample identification, station identification, preservative, analysis, sampler's initials, sample date, and time. Place samples in appropriate containers and pack with ice in coolers.

Requirements for sample collection, preservation, and analysis are listed in Table 3-2. Samples will be delivered to the laboratory as soon as possible to allow the samples to be analyzed within the specified holding times. Requirements for QA/QC samples are listed in Table 3-2. A CH2M HILL Level C data package will be required with appropriate QC samples from the offsite laboratory. All analytical data will be submitted by both hard copy and electronic files.

Waste characterization results will be reviewed and validated by CH2M HILL chemists and a third party contracted by CH2M HILL. All other data will be reviewed and validated by CH2M HILL.

Residual purge water collected during sampling will be transferred to a 55-gallon drum and will be characterized in accordance with this SAP and disposed of in accordance with procedures outlined in Section 4.0 Waste Management Plan.

3.4 Waste Characterization Sampling and Analyses

A CH2M HILL Level B package will be required along with appropriate QC samples for the required waste characterization. All analytical data will be submitted by both hard copy and electronic files.

A waste characterization sample will be collected to evaluate the handling and transportation and disposal requirements of accumulated purge water and any other miscellaneous collected water. The water characterization sample will be collected from containment drums prior to disposal. One composite sample (and one grab for VOC

analysis) will be collected from the sampling event. The water sample will be collected as follows and analyzed for the parameters listed in Table 3-2:

1. Using a bailer or dip jar, collect a water sample from its containment.
2. Fill the sample containers for volatile analyses first (grab sample). The 40-mL vials will be filled so that there is no headspace in each vial.
3. Then fill the sample containers for the remaining analyses.
4. Label and package the samples for shipment to the laboratory.

A CH2M HILL Level B package will be required along with appropriate QC samples for the required waste characterization and incidental waste stream samples. All analytical data will be submitted by both hard copy and electronic files.

3.5 Equipment Decontamination

Sampling methods and equipment have been selected to minimize decontamination requirements and the possibility of cross-contamination. The following procedures will be used for all sampling equipment used to collect routine samples undergoing trace organic or inorganic analyses.

Reusable sampling equipment will be decontaminated before the initial sample is collected and between sampling locations using the following procedure:

1. Clean with potable water and Alconox® or equivalent laboratory grade detergent using a brush, if necessary, to remove particulate matter and surface films.
2. Rinse thoroughly with potable water.
3. Rinse thoroughly with analyte-free water.
4. Rinse thoroughly with isopropanol (pesticide-grade). Do not rinse polyvinyl chloride (PVC) or plastic items with isopropanol.
5. Rinse thoroughly with organic/analyte-free water.
6. Allow equipment to air dry completely.

3.6 Sample Documentation

Sampling documentation will include the following:

- Numbered Chain-of-Custody Forms
- Sample logbook, which includes the following information:
  - Name of laboratories and contacts to which the samples were sent, turnaround time requested, and data results, when possible
  - Termination of a sample point or parameter and reasons

  - Unusual appearance or odor of a sample
  - Measurements, volume of flow, temperature, and weather conditions
  - Additional samples and reasons for obtaining them
  - Levels of protection used (with justification)
  - Meetings and telephone conversations held with the NAVFAC SE, regulatory agencies, project manager, or supervisor
  - Details concerning any samples split with another party
  - Details of QC samples obtained
  - Sample collection equipment and containers, including their serial or lot numbers. Details of QC samples obtained
  - Field analytical equipment, and equipment utilized to make physical measurements will be identified
  - Calculations, results, and calibration data for field sampling, field analytical, and field physical measurement equipment
  - Property numbers of any sampling equipment used, if available
  - Sampling station identification
  - Date and Time of sample collection
  - Description of the sample location
  - Description of the sample
  - Sampler(s)' name(s) and company
  - How the sample was collected
  - Diagrams of processes
  - Maps/sketches of sampling locations
  - Weather conditions that may affect the sample (e.g., rain, extreme heat or cold, wind, etc.)
- Sample Labels
- Custody Seals (minimum of two on each shipping container)

3.7 Field Quality Control

Field duplicate samples, equipment blanks, trip blanks, and matrix spike/matrix spike duplicates (MS/MSD) will be collected at the frequency specified in Table 3-2. Field QC samples are not required for disposal sampling.

3.8 Analytical Methods

Samples will be collected for analytical methods summarized in Table 3-2.

Preliminary and final analytical results will be faxed to Bethany Garvey in accordance with the turn around times listed in Table 3-2. Final hardcopy data and electronic file will be delivered to Kama White within 14 days of sample receipt. Contact information for Bethany Garvey and Kama White is provided as follows:

Bethany Garvey
Laboratory Coordinator
CH2M HILL
Northpark 400
1000 Abernathy Road, Suite 1600
Atlanta, GA 30328
(770) 604.9182 ext 54124
(678) 579.8176 (fax)
bethany.garvey@ch2m.com

Kama White
Database Coordinator
CH2M HILL
Northpark 400
1000 Abernathy Road, Suite 1600
Atlanta, GA 30328
(770) 604.9182 ext 54385
kama.white@ch2m.com

4.0 Waste Management Plan

The Waste Management Plan describes the waste management requirements and procedures for investigation activities at the Sherman Field Former Fuel Farm. The work to be performed at the site consists of groundwater sampling that includes use of an offsite fixed base laboratory for data analysis. Waste accumulated during the work will include purge water accumulated during groundwater sampling and decontamination fluids accumulated from equipment cleaning.

4.1 Waste Characterization and Profile

Waste characterization information typically will be included on a waste profile form provided by the offsite facility. It is assumed that wastes from this activity will be non-hazardous. CH2M HILL will provide analytical data from characterization sampling and analysis. However, in some cases, facilities that are permitted to accept a specific waste material may require specific or additional analyses to evaluate the waste stream before acceptance. Waste characterization sampling will be completed in accordance with Section 3.0 Sampling and Analysis Plan.

Waste characterization information for wastes will be documented on a waste profile form provided by the offsite treatment or disposal facility as part of the waste acceptance process. The profile will be reviewed and approved by the CH2M HILL Waste Coordinator prior to submission to the Navy for generator signature. Navy personnel will provide any required generator certification and/or signature. Signed profile will then be submitted to the disposal facility for acceptance approval.

The profile typically requires the following information including but not limited to:

- Generator (Navy) information including name, address, contact, and phone number
- Site name including street/mailing address
- Process generating waste
- Source of contamination
- Historical use for area
- Waste composition
- Physical state of waste (i.e., liquid)
- Hazardous waste codes, if applicable

A facility approved copy of the waste profile will be received prior to scheduling offsite transportation of the waste.

Typically, uncontaminated wastes such as general construction debris will be characterized using process knowledge and generally will be classified as municipal solid waste.

4.2 Waste Management

4.2.1 Waste Storage Time Limit

Liquids from groundwater well purging and decontamination activities will be contained in 55-gallon drums. The water is expected to be non-hazardous petroleum contaminated water and will be removed from the site as soon as possible. CH2M HILL will coordinate transportation, and disposal of the liquid waste contained in the 55-gallon drums. CH2M HILL will provide the waste characterization results to the Navy and coordinate waste characterization profile and manifest review and approval with NAS Pensacola personnel.

4.2.2 Labels

The labeling of waste containers will be in accordance with 49 CFR 172, 173 and 178. Labels will include the type of waste, location from which the waste was generated, and accumulation start date. Containers, and tanks used to store/accumulate waste will include one of the following labels:

- "Analysis Pending" or "Waste Material" - Temporary or handwritten label until analytical results are received and reviewed. This label will include the accumulation start date.
- "Non-Hazardous Waste" - Preprinted labels with the following information:
  - Accumulation start date
  - Generator name
  - EPA identification number
  - Waste-specific information (e.g., contaminated soil)

4.2.3 General Waste Management Requirements

Wastes will be accumulated in an area identified or approved by the Navy. If an area is not designated, wastes will be accumulated in an area that is not accessible to the general public, and can be secured.

Temporary waste accumulation areas will contain appropriate emergency response equipment. The HSP (Appendix B) identifies the specific emergency response procedures and equipment.

All containers, drums, and tanks will be inspected upon arrival at the site for equipment in disrepair and any contamination or contents. If container contains waste upon arrival or is in disrepair, it will be immediately rejected and documented.

The following guidelines relate to drums and small containers:

- Drums and small containers will be transported to the temporary accumulation areas on wood pallets and will be secured together with non-metallic banding.
- Drums will be inspected and inventoried upon arrival onsite for signs of contamination and/or deterioration.

- Adequate aisle space (e.g., 30 inches) will be provided for containers such as 55-gallon drums to allow the unobstructed movement of personnel and equipment. A row of drums should be no more than two drums wide.
- Each drum will be provided with its own label and labels will be visible.
- Drums will remain covered except when removing or adding waste to the drum. Covers will be properly secured at the end of each workday.
- Drums will be disposed of with the contents. If the contents are removed from the drums for offsite transportation and treatment or disposal, the drums will be decontaminated prior to re-use or before leaving the site.
- Drums containing liquids or hazardous waste will be provided with secondary containment.

Inspection of Waste Storage Areas

Waste accumulation areas will be inspected for malfunctions, deterioration, discharges, and leaks that could result in a release. The following inspection schedule will be followed:

- At a minimum, weekly inspection of containers (for leaks, signs of corrosion, or signs of general deterioration).

Any deficiencies observed or noted during inspection will be rectified immediately.

Inspections will be recorded in the daily Quality Control Report and include any deficiencies and how issue was rectified. Copies of the report will be maintained onsite, and available for review**.**

4.3 Shipping Documentation

Prior to offsite disposal of any waste, a waste approval package will be provided to the Navy for each waste stream. This package shall include a waste profile naming the United States Navy as the generator of the waste, analytical summary table(s) applicable to the waste, a completed waste manifest, and any other applicable information necessary for the Navy to complete its review of the disposal package and signature as the generator.

The signed profile will then be submitted to the disposal facility for acceptance approval. Once the approval letter is received from the disposal facility, transportation can be scheduled.

Each load of waste material will be manifested prior to leaving the site. At a minimum, the manifest form will include the following information:

- Generator information including name, address, contact, and phone number, EPA identification number
- Transporter information including name, address, contact and phone number, USEPA identification number

- Facility information including name, address, phone number, USEPA identification number
- Site name including street/mailing address
- U.S. Department of Transportation (DOT) Proper Shipping Name
- Quantity of waste (volumetric estimate)
- CTO or job number
- Profile number
- 24-hour emergency phone number.

The generator (Navy) and the transporter must sign the manifest prior to the load of waste leaving the site. A copy of the manifest will be retained on site and included with the daily Quality Control Report. The original signed manifest will be returned to the address of the generator. The facility will provide a copy of this signed manifest to CH2M HILL for the final report. The final report will include copies of the facility signed manifest and the Certificate of Disposal/Destruction/Recycle.

4.5 Disposal

Offsite treatment, recycling or disposal facilities will use the waste profile and supporting documentation, such as analytical results, to determine if the facility will accept a waste. Petroleum contaminated liquids will be sent to a qualified waste water treatment facility permitted to accept the waste.

5.0 Quality Control Plan

This QC Plan identifies the Project QC Manager, minimum daily report and inspection requirements, and the definable features of work.

The Submittal Register, included in Appendix C, documents submittals in accordance with CH2M HILL's Contract Management Plan (CH2M HILL, 2003). CH2M HILL, the Navy, or others will approve submittals as identified in the Submittal Register (Appendix C). All approved submittals will be distributed by CH2M HILL to the appropriate Navy personnel (CO, ROICC [in duplicate], etc.), the project site, and to the project file.

The Contractor Production Report and Contractor Quality Control Report, along with preparatory phase report, will be distributed by CH2M HILL to appropriate Navy personnel and a copy maintained in the project file.

5.1 Appointing Letter of Project QC Manager

The Project QC Manager for this CTO will be Ms. Phyllis Zerangue. The appointing letter for Ms. Zerangue is included in Appendix D.

5.2 Field Inspections

Inspections of the groundwater elevation and LNAPL surveys and groundwater sampling at NAS Pensacola will be performed in accordance with the three phases of control, as described in the NAS Pensacola Basewide Work Plan (CH2M HILL, 2000). The definable features of work for activities included in this SA WP are:

- Mobilization and Site Preparation
- Well Verification and Groundwater Elevation and LNAPL Survey
- Groundwater Sampling
- Decontamination and Demobilization

The field inspections associated with the definable features of work items are described below.

5.2.1 Mobilization and Site Preparation

As part of the mobilization activity, a pre-activity meeting will be held to review the preparedness to begin the project and the procedures and schedule to complete the project. The preparedness check will verify that the proper equipment and documentation for recording data collected during the groundwater and LNAPL survey are onsite. The site preparation task will include obtaining site access, verifying the well locations, and verifying the equipment is in good working condition.

Mobilization and site preparation inspections include:

Task	Procedures/Construction Details
Pre-activity Meeting	• Verify site access from NAS Pensacola • Verify equipment and documentation for recording data is onsite
Pre-Activity	• Verify monitoring well locations • Verify that equipment is operating as designed

The following quality controls will be implemented during the mobilization and site preparation activities:

Preparatory Phase

The preparatory phase will include a review of the relevant activity hazard analyses (AHAs), the SA WP, communications matrix, project schedule, submittal status, and confirming that appropriate materials and equipment are available to commence the work activities.

Initial Phase

Inspections will be made as necessary to verify the groundwater elevation and LNAPL survey locations are identified, and that the equipment used to measure the elevations is in good working condition.

Follow-up Phase

The Project QC Manager will provide continuous oversight of the site preparation activities to verify that the work is completed in accordance with the requirements provided in this SA WP. Deficiencies will be noted and corrected.

5.2.2 Well Verification and Groundwater Elevation and LNAPL Survey

Preparatory Phase

The preparatory phase will include a review of decontamination procedures, the site-specific health and safety plan, and relevant AHA forms.

Initial Phase

The site superintendent will perform inspections to confirm that the objectives of the survey has been met and that the rework items, if any, have been completed to the satisfaction of CH2M HILL.

Follow-up Phase

The Project QC Manager will provide continuous oversight of the surveys to verify that the work is completed in accordance with the requirements provided in this SA WP. Deficiencies will be noted and corrected.

Well verification inspections will include:

Task	Procedures/Construction Details
Well Assessment/ Locates	• Update site map with approximate well location; obtain global positioning system (GPS) data, if available, with hand-held or portable unit • Assess integrity of well: locking cap, general appearance, location consistent with site map, etc. • Zero liquid level indicator • Perform elevations from same nautical side of well • Record field data

5.2.3 Groundwater Sampling

Preparatory Phase

The preparatory phase will include a review of SAP procedures, the site-specific health and safety plan, and relevant AHA forms.

Initial Phase

The site superintendent will perform inspections to confirm that the SAP procedures are being properly followed, and that the rework items, if any, have been completed to the satisfaction of CH2M HILL.

Follow-up Phase

The Project QC Manager will provide continuous oversight of the sampling to verify that the work is completed in accordance with the requirements provided in this SA WP. Deficiencies will be noted and corrected.

Groundwater sampling inspections will include:

Task	Procedures/Construction Details
Field Sampling	• Verify sample kit is accurate and complete • Coordinate sample shipment with laboratory • Obtain laboratory certification • Review SOPs and work practices for compliance with procedures • Review chain of custody records for accuracy and completeness • Ensure QC samples collected at prescribed frequency • Verify equipment and documentation for recording data is onsite

5.2.4 Decontamination and Demobilization

Equipment and personnel will be decontaminated and demobilized from the site following completion of the work activities identified in this SA WP. The Project QC Manager will verify that the objectives associated with the remedial activities have been met.

The following quality controls will be implemented during decontamination and demobilization activities:

Preparatory Phase

The preparatory phase will include a review of decontamination procedures, the site-specific health and safety plan, and relevant AHA forms.

Initial Phase

The Project Superintendent will perform inspections to confirm that the objectives of the decontamination and site restoration activities have been met and that the rework items, if any, have been completed to the satisfaction of CH2M HILL and the Navy.

Follow-up Phase

The Project QC Manager will provide continuous oversight of the demobilization to verify that the work is completed in accordance with the requirements provided in the SA WP. Deficiencies will be noted and corrected.

Site restoration and demobilization inspections include:

Task	Procedures/Construction Details
Decontamination and Demobilization	• Inspect work areas to verify all equipment and materials are safely removed from the site • Inspect work areas to verify project housekeeping and cleaning were completed • Complete site survey • Decontamination of equipment • Final Inspections • Orderly Site Demobilization • Collation of Site Records & Documents • Final Reports & Deliverables

5.3 Test Control

Environmental measurements will be collected in accordance with the procedures outlined in Section 2.0 of this SA WP. The Testing Plan and Log, provided in Appendix C, provides required testing for this SA WP. The Project QC Manager will verify the following:

- Groundwater elevation and LNAPL survey equipment is available and complies with testing standards.
- Groundwater sampling equipment is available and is working properly in accordance with the manufacturer's operating instructions.
- Field instruments are calibrated in accordance with manufacturers' recommendations.
- Recording forms, including all of the test documentation requirements, have been prepared and are accurate and complete.

6.0 References

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CH2M HILL Constructors, Inc. (CH2M HILL). 2003. *Contract Management Plan*. Contract No. N62467-01-D-0331. April.

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Appendix A
Groundwater Monitoring Well Gauging Form

Well Gauging Form

Free Product Delineation and Groundwater Sampling at Sherman Field FFF

NAS Pensacola, Pensacola, Florida

Well ID	Date	Time	Top of Casing Elevation (ft msl)	Total Depth (ft btoc)	Depth to Free Product (ft btoc)	Depth to Groundwater (ft btoc)	Free Product Thickness (feet)	Comments
Wells in GIS and Installed During Site Assessment								
MW1-S			40.01					
MW2-S			43.95					
MW3-S			45.65					
MW4-S			44.88					
MW5-I			31.65					
MW7-S			28.83					
MW8-S			31.47					
MW9-S			29.24					
MW10-R			29.85					
MW11-S			27.99					
MW12-S			33.47					
MW13-D			45.01					
MW13-S			36.24					
MW14-I			32.27					
MW14-S			31.47					
MW15-S			30.62					
MW16-S			31.62					
MW17-S			34.28					
MW18-S			32.29					
MW19-S			35.87					
MW20-S			36.13					
MW21-S			28.83					
MW22-S			33.01					
MW23-S			29.59					

ft msl - feet above mean sea level

ft btoc - feet below top of casing

Well Gauging Form

Free Product Delineation and Groundwater Sampling at Sherman Field FFF

NAS Pensacola, Pensacola, Florida

Well ID	Date	Time	Top of Casing Elevation (ft msl)	Total Depth (ft btoc)	Depth to Free Product (ft btoc)	Depth to Groundwater (ft btoc)	Free Product Thickness (feet)	Comments
Wells Not in GIS But Well Logs in Site Assessment Report								
MW5-S			31.86					
MW6-S			30.67					
MW24-I			34.65					
MW24-S			34.72					
MW25-S			34.04					
MW26-S			31.14					
MW27-S			33.55					
Wells Not in GIS and Previously Installed Prior to Site Assessment								
MW-4			31.21					
MW-7			33.99					
MW-9			30.03					
MW-11			31.10					
MW-12			32.37					
MW-16			37.43					
MW-18			43.77					
MW-19			35.38					
MW-24			30.75					
MW-25			31.21					
MW-30			33.88					
MW-31			32.69					
OW-4			30.05					
Wells Not in GIS, No Construction Information in Site Assessment Report								
MW-4			NA					
MW-7			NA					
MW-9			NA					
MW-11			NA					
MW-12			NA					
MW-16			NA					

ft msl - feet above mean sea level

ft btoc - feet below top of casing

Appendix B
Health and Safety Plan

Health and Safety Plan

LNAPL Delineation and Groundwater Sampling at Sherman Field Former Fuel Farm Underground Storage Tank Site 000024 Naval Station Pensacola Pensacola, Florida

Contract No. N62467-01-D-0331
Contract Task Order No. 0085

Revision 00

Submitted to:

U.S. Naval Facilities
Engineering Command
Southern Division

Prepared by:

CH2MHILL

Northpark 400
1000 Abernathy Road
Suite 1600
Atlanta, GA 30328

March 2008

Contents

Attachments

Acronyms

°F	degrees Fahrenheit
AHA	Activity Hazard Analysis
ALARA	as low as reasonably achievable
APR	air-purifying respirator
ATL	Atlanta
BBLPS	Behavior Based Loss Prevention System
bgs	below ground surface
CH2M HILL	CH2M HILL Constructors, Inc.
CNS	central nervous system
CPR	cardiopulmonary resuscitation
CTO	Contract Task Order
dBA	decibel A-rated
DOT	Department of Transportation
FA	first aid
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
GCTL	Groundwater Cleanup Target Level
GFCI	ground fault circuit interrupter
HAZCOM	hazard communication
HR	heart rate
HSM	Health and Safety Manager
HSP	Health and Safety Plan
IDLH	immediately dangerous to life and health
IDW	investigation-derived waste
IRF	Incident Report Form
Lb	Pound
LEL	lower explosive limit
LNAPL	light non-aqueous phase liquid
LPO	Loss Prevention Observations
mg/m^3	milligrams per cubic meter
MSDS	Material Safety Data Sheet
msl	Mean sea level
mW/cm^2	milliwatt per square centimeter
NAVFAC EFD SOUTH	U.S. Navy Facilities Engineering Command, Southern Division
NDG	nuclear density gauge
NLI	Near Loss Investigation
NAS	Naval Air Station
NSC	National Safety Council
NTR	Navy Technical Representative
OSHA	Occupational Safety and Health Administration
PAHs	polynuclear aromatic hydrocarbons
PAPR	powered air-purifying respirator
PDF	personal flotation device

PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
PTSP	Pre-Task Safety Plan
RAP	Remedial Action Plan
RMSF	Rocky Mountain Spotted Fever
SAR	supplied-air respirator
SCBA	self-contained breathing apparatus
SHSS	Site Health and Safety Specialist
SOP	standard of practice
STEL	short-term exposure limit
SZ	support zone
T&D	Transportation and disposal
TBD	to be determined
TMCC	truck-mounted crash cushion
TRPHs	total recoverable petroleum hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
TSDF	treatment, storage, and disposal facility
UST	underground storage tank
VOCs	volatile organic compounds

This Health and Safety Plan (HSP) will be kept on the site during field activities and will be reviewed as necessary. The plan will be amended or revised as project activities or conditions change or when supplemental information becomes available. The plan adopts, by reference, the Standards of Practice (SOPs) in the CH2M HILL *Corporate Health and Safety Program, Program and Training Manual*, as appropriate. In addition, this plan adopts procedures in the project Work Plan. The Site Health and Safety Specialist (SHSS) is to be familiar with these SOPs and the contents of this plan. CH2M HILL Constructors Inc.'s (CH2M HILL) personnel and subcontractors must sign Attachment 1.

1.0 Project Information and Description

CONTRACT TASK ORDER (CTO) No: 085

CLIENT: Southern Division, U.S. Navy Facilities Engineering Command (NAVFAC EFD SOUTH)

PROJECT/SITE NAME: Naval Air Station Pensacola

SITE ADDRESS: Pensacola, FL

CH2M HILL PROJECT MANAGER: Casey Hudson

CH2M HILL OFFICE: Atlanta, Georgia

DATE HEALTH AND SAFETY PLAN PREPARED: March 28, 2008

DATE(S) OF SITE WORK: July-August 2008

SITE BACKGROUNG AND SETTING:

Naval Air Station (NAS) Pensacola is located in northwest Florida on the western side of Pensacola Bay, approximately 2 miles south of Pensacola, Florida, on Navy Boulevard. The site is located on the western perimeter of the base, approximately 2400 feet north of Radford Boulevard. The Sherman Field Former Fuel Farm, Underground Storage Tank (UST) Site 000024, is an approximately 3.5-acre fenced area including four cut-and-cover storage tanks. The petroleum storage tank system was installed circa 1945 and was used to store JP-4 jet fuel. An equipment malfunction led to a release of 48,000 gallons of JP-4 in 1983. NAS Pensacola personnel initially installed four recovery ditches and recovered approximately 600 to 700 gallons of product. Shortly thereafter, use of the recovery ditches was discontinued by direction of the NAS Pensacola Fire Marshall. In August 1983, a product/groundwater recovery well system was installed. The recovery system proved ineffective and recovery efforts were discontinued. The fuel storage tanks were abandoned in place in 1995 when a new fuel facility was constructed adjacent to the south of the original fuel farm.

Based on a Site Assessment performed by TetraTech NUS (TtNUS) in 2000, the former USTs at the Sherman Field Former Fuel Farm were installed upon a flat cut base and then covered with fill. Typical site lithology is yellowish brown to light brown to white, silty-fine to medium-grained sand at normal land surface and below the tank mound to approximately 38 feet below ground surface (bgs). Discontinuous 1-foot thick layers of peat at 38 feet bgs and below were the only potentially confining layers encountered during the site assessment investigation.

Depths to groundwater ranged from 7.5 to 28.3 feet bgs in shallow wells at the site, reflecting the difference in elevation of wells installed in the mound covering the tanks and those installed off the mound. Water table elevation ranged from 18 to 22 feet above mean sea level (msl). Groundwater flow in the shallow area is generally to the south-southeast; however, it is localized in a radial pattern near the tank mound.

In 2000, 50 wells were gauged for light non-aqueous phase liquid (LNAPL) thickness. LNAPL measurements ranged from a visible sheen in three wells (MW2-S, MW3-S, and MW16-S) to 1.64 feet (MW-1) in thickness. Seven of the monitoring wells at the site contained measurable LNAPL thickness.

Site assessment data indicated contaminated soil was generally limited to the vicinity of the former fuel tanks, dissolved petroleum contaminants exceeded Florida Department of Environmental Protection (FDEP) groundwater cleanup target levels (GCTLs) in site groundwater, and LNAPL was present in existing site monitoring wells. The Site Assessment Report recommended a Remedial Action Plan (RAP) to address the LNAPL.

A RAP was completed for the Sherman Field Former Fuel Farm in November 2002. The remedial action goal for the site was to remove LNAPL in excess of 0.01 foot. The RAP recommendation for treatment of hydrocarbons within the vadose zone and recovery of LNAPL was a bioslurping pilot study for full-scale implementation.

DESCRIPTION OF SPECIFIC TASKS TO BE PERFORMED:

Free product thickness and groundwater levels will be measured in monitoring wells located at and in the Sherman Field Former Fuel Farm using an electronic oil/water interface probe. Groundwater levels may be measured with an electronic water level indicator if product is not present in the well. The tape or sounding wire for the interface probe or water level indicator will be marked in increments of 0.010 feet. The measurements will be recorded in the field logbook. A list of the monitoring wells that will be measured as part of the survey is presented on Table 2-1 of the Work Plan. Well locations are shown in Figure 1-3 of the Work Plan. Damaged wells or wells that cannot be located (wells were last gauged in 2002) will be noted on the well gauging form.

Free product thickness and groundwater levels will be measured using the following procedure:

1. Decontaminate the oil/water interface probe or water level indicator.
2. Unlock and uncap the observation/recovery/monitoring well and locate the reference mark on the top of the well casing. Record the well number, date and time in the logbook.
3. Lower the probe into the well until contact is made with product or water.
4. If LNAPL is detected, record the depth to product to the nearest 0.010 foot in the logbook. Continue to lower the probe until water is detected and record the depth to water to the nearest 0.010 foot. Continue to lower the probe to the bottom of the well and record the total well depth to the nearest 0.010-foot. Subtract the depth to product from the depth to water to determine the product thickness.
5. If water is detected, record the depth to water to the nearest 0.010 foot. Continue to lower the probe to the bottom of the well and record the total well depth to the nearest 0.010-foot.

Personnel and equipment will be properly decontaminated to remove all contamination that may be adhering to personnel or equipment as a result of the free product thickness and

water level measurement survey activities. If any water is accumulated during the decontamination process, it will be containerized in a 55-gallon drum for waste characterization and disposal at a later date (i.e., when remedial activities will be performed).

Following product and water level gauging, groundwater will be sampled from select wells to evaluate the magnitude and preliminary extent of dissolved hydrocarbons, lead, and monitored natural attenuation parameters as described in the WP.

Decontamination of personnel and equipment will be performed in accordance with this Health and Safety Plan and the applicable provisions of 29 Code of Federal Regulations (CFR) 1910.120.

Upon completion of the fieldwork, all resources mobilized to the site will be demobilized. CH2M HILL will coordinate with NAS Pensacola Facilities and Engineering Division and the ROICC for any notification requirements.

2.0 Tasks to be Performed Under this Plan

Refer to project documents (i.e., Work Plan) for detailed task information. A health and safety risk analysis (Table 2-1) has been performed for each task and is incorporated in this plan through task-specific hazard controls and requirements for monitoring and protection. Tasks other than those listed below require an approved amendment or revision to this plan before tasks begin.

2.1 Hazwoper-Regulated Tasks

- Free product/groundwater gauging
- Collection of groundwater samples
- Characterization, containerization, transportation, and disposal (T&D) of contaminated waste
- Decontamination

2.2 Non-Hazwoper-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-Hazwoper-trained personnel. **Prior approval from the Health and Safety Manager (HSM) is required before these tasks are conducted on regulated hazardous waste sites.**

Tasks	Controls
• Mobilization/demobilization • Data management	• Brief on hazards, limits of access, and emergency procedures • Post contaminant areas as appropriate • Sample and monitor as appropriate

TABLE 2.1
Hazard Analysis
(Refer to Section 3 for hazard controls)

	Mobilization and site preparation	Free product and ground water gauging	Groundwater Sampling	Decontamination		
Manual Lifting (HS-29)	X	X	X	X		
Hand & Power Tools (HS-50)	X	X	X			
Chemical Hazard-Dermal/Inhalation		X	X	X		

3.0 Hazard Controls

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. These practices and controls are to be implemented by the party in control of either the site or the particular hazard. CH2M HILL employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. CH2M HILL employees and subcontractors who do not understand any of these provisions should contact the SHSS for clarification.

The health and safety hazards posed by field activities have been identified for each project activity and is provided in the Hazard Analysis Table (Table 2-1) in this section. Hazard control measures for project-specific and general H&S hazards are provided in 3.1 and 3.2 of this section.

Activity Hazard Analyses (AHAs) will be prepared before beginning each project activity posing Health and Safety hazards to project personnel using the AHA form provided in the HSP Attachments as a guide. The AHA shall identify the work tasks required to perform each activity, along with potential H&S hazards and recommended control measures for each work task. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified. **AHAs shall be submitted to the Navy Technical Representative (NTR) for review at least 15 days prior to the start of each project activity phase**.

In addition to the controls specified in this section, Project-Activity Self-Assessment Checklists are contained in Attachment 5. These checklists are to be used to assess the adequacy of CH2M HILL and subcontractor site-specific safety requirements. The objective of the self-assessment process is to identify gaps in project safety performance, and prompt for corrective actions in addressing these gaps. Self-assessment checklists should be completed early in the project, when tasks or conditions change, or when otherwise specified by the HSM. The self-assessment checklists, including documented corrective actions, should be made part of the permanent project records.

Project-activity self-assessments checklist will be completed weekly by the SHSS during the course of the project, completing the applicable checklist depending on the work performed at the time on the project.

3.1 Project-Specific Hazards

3.1.1 Uneven walking surfaces

Employees walking in ditches, swales and other drainage structures adjacent to roads or across undeveloped land must use caution to prevent slips and falls which can result in twisted or sprained ankles, knees, and backs.

Whenever possible operate from a flat surface and do not enter a steep ditch or hillside.

If steep terrain must be negotiated, sturdy leather safety shoes or boots with that provide a high degree of traction and ankle support should be used. The need for ladders or ropes to provide stability should be evaluated.

Avoid extremely tall grass/vegetation areas where the ground surface level can not readily be anticipated or directly observed.

Clear and grub heavily covered areas where possible prior to conducting regular activities in the work area.

3.1.2 Utility Vehicle Operation

Utility vehicles may be used on project sites to move people, equipment, and supplies around a work site. These vehicles present the potential for injury to personnel by roll-over and impact accidents. Utility vehicles should be operated in a cautious and safe manner as prescribed in their manufacture's operator's manuals. It is important to remember that these vehicles are not designed for recreational use and that horseplay and recreational use can lead to equipment damage, severe bodily injury, or death.

The following rules apply when ever a utility vehicle is used for project activities.

- Before operation, the vehicle should be inspected for damage or wear.
- Utility vehicles are for off-road use only.
- If equipped, seat belts are to be worn by operator and passenger(s) whenever vehicle is in motion.
- Before operation, personnel should read the operator's manual and view the safety video provided by the manufacturer. (if available)
- Only one rider per seat. Employees are not permitted to ride on the box or anywhere else on the vehicle.
- Never exceed the vehicle's recommended weight capacity.
- Reduce speed on rough and hilly ground and whenever turning the vehicle.
- Never cross any body of water that is deeper than is deeper than recommended by the manufacturer, or where the depth of the water is unknown.
- Utility vehicles must have operable brakes capable of stopping the vehicle on slopes and when fully loaded

3.1.3 Adverse Weather

Sudden inclement weather can rapidly encroach upon field personnel. Field crew members performing work outdoors should carry clothing appropriate for bad weather. In severe weather conditions, (i.e., high wind or electrical storms), the field crews should leave the area and find safe shelter until the weather abates and until a decision is made to resume the field activities.

In the event of an adverse weather event, such as a thunderstorm, field personnel may encounter flash flooding. Whenever precipitation is expected, all personnel should stay out of low lying areas until it is apparent that the rain has stopped or the threatening weather system has passed. Areas where personnel may be at risk from flash flooding include, but are not limited to; stream and river beds, valleys, drainage ditches, culverts, etc. Under no circumstances, should any personnel attempt to drive vehicles over or through flooded roadways, bridges or stream crossings. Personnel working in low lying areas or other areas where flash flooding is likely to occur, should plan egress routes and equipment placement to minimize the chance that they may be trapped or swept away by rising water.

Preparedness and caution are the best defenses against lightning. Many lightning deaths and injuries happen before or after a thunderstorm's peak. The site manager or SHSO shall monitor weather forecasts for predictions of electrical storms in the area. At first sight of lightning, operations shall be stopped and only resumed when conditions permit. The site manager or SHSO shall monitor weather conditions to determine when it is appropriate to resume work. The lightning safety recommendation is 30-30: Seek refuge when thunder sounds within 30 seconds after a lightning flash; and do not resume activity until 30 minutes after the last thunder clap. Some other general precautions include:

- Know where to go and how long it will take to get there. If possible, take refuge in a large building or vehicle. Do not go into a shed in an open area.
- The inclination to see trees as enormous umbrellas is the most frequent and most deadly mistake. Do not go under a large tree that is standing alone. Likewise, avoid poles, antennae and towers.
- Stay away from lakes, streams, pools, or any water.
- Stay away from railroad tracks that can carry lightning charges for long distances.
- If the area is wide open, go to a valley or ravine, but be aware of flash flooding. Do not stand on top of a hill.
- If you are caught in a level open area during an electrical storm and you feel your hair stand on end, drop to your knees, bend forward and put your hands on your knees or crouch. The idea is to make yourself less vulnerable by being as low to the ground as possible and taking up as little ground space as possible. Lying down is dangerous, since the wet earth can conduct electricity. Do not touch the ground with your hands.
- Do not use telephones during electrical storms, except in the case of emergency

3.2 General Hazards

3.2.1 General Practices and Housekeeping

(Reference CH2M HILL- SOP HS-20, *General Practices*)

- Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness require enough illumination intensity to read a newspaper without difficulty.
- Good housekeeping must be maintained at all times in all project work areas.
- Common paths of travel should be established and kept free from the accumulation of materials.

- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- Provide slip-resistant surfaces, ropes, and/or other devices to be used.
- Specific areas should be designated for the proper storage of materials.
- Tools, equipment, materials, and supplies shall be stored in an orderly manner.
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.
- All spills shall be quickly cleaned up. Oil and grease shall be cleaned from walking and working surfaces.

3.2.2 Hazard Communication

(Reference CH2M HILL-SOP HS-05, *Hazard Communication)*

The SHSS is to perform the following:

- Complete an inventory of chemicals brought on site by CH2M HILL using Attachment 2.
- Confirm that an inventory of chemicals brought on site by CH2M HILL subcontractors is available.
- Request or confirm locations of Material Safety Data Sheets (MSDSs) from the client, contractors, and subcontractors for chemicals to which CH2M HILL employees potentially are exposed.
- Before or as the chemicals arrive on site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.
- Give employees required chemical-specific HAZCOM training using Attachment 3.
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

3.2.3 Shipping and Transportation of Chemical Products

(Reference CH2M HILL's *Procedures for Shipping and Transporting Dangerous Goods)*

Chemicals brought to the site might be defined as hazardous materials by the U.S. Department of Transportation (DOT). All staff who ship the materials or transport them by road must receive CH2M HILL training in shipping dangerous goods. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

3.2.4 Lifting

(Reference CH2M HILL-SOP HS-29, *Lifting*)

- Proper lifting techniques must be used when lifting any object.
- Plan storage and staging to minimize lifting or carrying distances.
- Split heavy loads into smaller loads.
- Use mechanical lifting aids whenever possible.
- Have someone assist with the lift -- especially for heavy or awkward loads.
- Make sure the path of travel is clear prior to the lift.

3.2.5 Fire Prevention

(Reference CH2M HILL- SOP HS-22, *Fire Prevention*)

- Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet. Extinguishers must:
  - be maintained in a fully charged and operable condition,
  - be visually inspected each month, and
  - undergo a maintenance check each year.
- The area in front of extinguishers must be kept clear.
- Post "Exit" signs over exiting doors, and post "Fire Extinguisher" signs over extinguisher locations.
- Combustible materials stored outside should be at least 10 feet from any building.
- Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.
- Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

3.2.6 Electrical

(Reference CH2M HILL-SOP HS-23, *Electrical*)

- Only qualified personnel are permitted to work on unprotected energized electrical systems.
- Only authorized personnel are permitted to enter high-voltage areas.
- Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until lockout/tagout procedures are implemented.
- Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use defective electrical equipment, remove from service.
- All temporary wiring, including extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.

- Extension cords must be:
  - equipped with third-wire grounding.
  - covered, elevated, or protected from damage when passing through work areas.
  - protected from pinching if routed through doorways.
  - not fastened with staples, hung from nails, or suspended with wire.
- Electrical power tools and equipment must be effectively grounded or double-insulated UL approved.
- Operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Maintain safe clearance distances between overhead power lines and any electrical conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact. Maintain at least 10 feet from overhead power lines for voltages of 50 kV or less, and 10 feet plus ½ inch for every 1 kV over 50 kV.
- Temporary lights shall not be suspended by their electric cord unless designed for suspension. Lights shall be protected from accidental contact or breakage.
- Protect all electrical equipment, tools, switches, and outlets from environmental elements.

3.2.7 Stairways and Ladders

(Reference CH2M HILL-SOP HS-25, *Stairways and Ladders*)

- Stairway or ladder is generally required when a break in elevation of 19 inches or greater exists.
- Personnel should avoid using both hands to carry objects while on stairways; if unavoidable, use extra precautions.
- Personnel must not use pan and skeleton metal stairs until permanent or temporary treads and landings are provided the full width and depth of each step and landing.
- Ladders must be inspected by a competent person for visible defects prior to each day's use. Defective ladders must be tagged and removed from service.
- Ladders must be used only for the purpose for which they were designed and shall not be loaded beyond their rated capacity.
- Only one person at a time shall climb on or work from an individual ladder.
- User must face the ladder when climbing; keep belt buckle between side rails
- Ladders shall not be moved, shifted, or extended while in use.
- User must use both hands to climb; use rope to raise and lower equipment and materials
- Straight and extension ladders must be tied off to prevent displacement

- Ladders that may be displaced by work activities or traffic must be secured or barricaded
- Portable ladders must extend at least 3 feet above landing surface
- Straight and extension ladders must be positioned at such an angle that the ladder base to the wall is one-fourth of the working length of the ladder
- Stepladders are to be used in the fully opened and locked position
- Users are not to stand on the top two steps of a stepladder; nor are users to sit on top or straddle a stepladder
- Fixed ladders > 24 feet in height must be provided with fall protection devices.
- Fall protection should be considered when working from extension, straight, or fixed ladders greater than 6 feet from lower levels and both hands are needed to perform the work, or when reaching or working outside of the plane of ladder side rails.

3.2.8 Heat Stress

(Reference CH2M HILL- SOP HS-09, *Heat and Cold Stress*)

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50oF to 60oF should be available. Under severe conditions, drink one to two cups every 20 minutes, for a total of 1 to 2 gallons per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.
- Acclimate yourself by slowly increasing workloads (e.g., do not begin with extremely demanding activities).
- Use cooling devices, such as cooling vests, to aid natural body ventilation. These devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- Avoid direct sun whenever possible, which can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.
- Provide adequate shelter/shade to protect personnel against radiant heat (sun, flames, hot metal).
- Maintain good hygiene standards by frequently changing clothing and showering.
- Observe one another for signs of heat stress. Persons who experience signs of heat syncope, heat rash, or heat cramps should consult the SHSS to avoid progression of heat-related illness.

Symptoms and Treatment of Heat Stress					
	Heat Syncope	Heat Rash	Heat Cramps	Heat Exhaustion	Heat Stroke
Signs and Symptoms	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.
Treatment	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool– but not cold– water. Call ambulance, and get medical attention immediately!

3.2.8.1 Monitoring Heat Stress

These procedures should be considered when the ambient air temperature exceeds 70ºF, the relative humidity is high (>50 percent), or when workers exhibit symptoms of heat stress. The heart rate (HR) should be measured by the radial pulse for 30 seconds, as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 100 beats/minute, or 20 beats/minute above resting pulse. If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the pulse rate still exceeds 100 beats/minute at the beginning of the next rest period, the work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 100 beats/minute, or 20 beats/minute above resting pulse.

3.2.9 Cold Stress

(Reference CH2M HILL- SOP HS-09, *Heat and Cold Stress*)

- Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.
- Consider monitoring the work conditions and adjusting the work schedule using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).
- Wind-Chill Index is used to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For those reasons, it should only be used as a guideline to warn workers when they are in a situation that can cause cold-related illnesses.
- NSC Guidelines for Work and Warm-Up Schedules can be used with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not

absolute; workers should be monitored for symptoms of cold-related illnesses. If symptoms are not observed, the work duration can be increased.

- Persons who experience initial signs of immersion foot, frostbite, hypothermia should consult the SHSS to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review weather forecast – be aware of predicted weather systems along with sudden drops in temperature, increase in winds, and precipitation.

Symptoms and Treatment of Cold Stress

	Immersion (Trench) Foot	Frostbite	Hypothermia
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.	Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.
Treatment	Seek medical treatment immediately.	Remove victim to a warm place. Re-warm area quickly in warm–but **not** hot–water. Have victim drink warm fluids, but **not** coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Remove victim to a warm place. Have victim drink warm fluids, but **not** coffee or alcohol. Get medical attention.

- Cylinders must be secured on a cradle, basket, or pallet when hoisted; they may not be hoisted by choker slings.

3.3 Biological Hazards and Controls

3.3.1 Snakes

Snakes typically are found in underbrush and tall grassy areas. If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. **DO NOT** apply ice, cut the wound, or apply a tourniquet. Try to identify the type of snake: note color, size, patterns, and markings.

3.3.2 Poison Ivy and Poison Sumac

Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas. Become familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.

3.3.3 Ticks

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots; spray **only outside** of clothing with permethrin or permanone and spray skin with only DEET; and check yourself frequently for ticks.

If bitten by a tick, grasp it at the point of attachment and carefully remove it. After removing the tick, wash your hands and disinfect and press the bite areas. Save the removed tick. Report the bite to human resources. Look for symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF). Lyme: a rash might appear that looks like a bullseye with a small welt in the center. RMSF: a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, and bone pain may develop. If symptoms appear, seek medical attention.

3.3.4 Bees and Other Stinging Insects

Bee and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform the SHSS and/or buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.

3.3.5 Bloodborne Pathogens

(Reference CH2M HILL- SOP HS-36, *Bloodborne Pathogens*)

Exposure to bloodborne pathogens may occur when rendering first aid or CPR, or when coming into contact with landfill waste or waste streams containing potentially infectious material. Exposure controls and personal protective equipment (PPE) are required as specified in CH2M HILL SOP HS-36, *Bloodborne Pathogens*. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.

3.3.6 Mosquito Bites

Due to the recent detection of the West Nile Virus in the Southeastern United States, it is recommended that **preventative measures** be taken to reduce the probability of being bitten by mosquitoes whenever possible. Mosquitoes are believed to be the primary source for exposure to the West Nile Virus as well as several other types of encephalitis. The following guidelines should be followed to reduce the risk of these concerns for working in areas where mosquitoes are prevalent:

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.

- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35 percent DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations (greater than 35 percent) provides no additional protection.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

Note: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

3.3.6.1 Symptoms of Exposure to the West Nile Virus

- Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death.
- The West Nile Virus incubation period is from 3-15 days.
- If you have any questions or to report any suspicious symptoms, contact the project Health and Safety Manager.

3.4 Radiological Hazards and Controls

Refer to CH2M HILL's Corporate Health and Safety Program, Program and Training Manual, and Corporate Health and Safety Program, Radiation Protection Program Manual, for standards of practice in contaminated areas.

3.5 Contaminants of Concern

Contaminants of Concern are listed in Table 3-1.

TABLE 3-1
Contaminants of Concern

Contaminant	Location and Maximum[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Benzene	GW: SB: SS:	1 ppm	2,000	High levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Eating or drinking foods containing high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, rapid heart rate, and death.	11.06
Toluene	GW: SB: SS:	200 ppm	____	Inhalation, ingestion or contact (skin,eyes) with vapors or substance may cause severe burning sensation.	_____

Contaminant	Location and Maximum[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Ethyl benzene	GW: SB: SS:	100 ppm	____ _	Inhalation, ingestion or contact (skin,eyes) with vapors or substance may cause severe burning sensation, nausea and nervousness .	_____
Xylene	GW: SB: SS:	100 ppm		High levels of xylene for short periods can also cause irritation of the skin, eyes, nose, and throat; difficulty in breathing; problems with the lungs; delayed reaction time; memory difficulties; stomach discomfort; and possibly changes in the liver and kidneys. It can cause unconsciousness and even death at very high levels.	

Footnotes:
[a] Specify sample-designation and media: (GW = Groundwater).
[b] Appropriate value of PEL, REL, or TLV listed.
[c] IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen.
[d] PIP = photoionization potential; NA = Not applicable; UK = Unknown.

3.6 Potential Routes of Exposure

Dermal: Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 4.

Inhalation: Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in Sections 4 and 5, respectively.

Other: Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).

4.0 Project Organization and Personnel

4.1 CH2M HILL Employee Medical Surveillance and Training

(Reference CH2M HILL- SOPs HS-01, *Medical Surveillance*, and HS-02, *Health and Safety Training)*

The employees listed meet state and federal hazardous waste operations requirements for 40-hour initial training, 3-day on-the-job experience, and 8-hour annual refresher training. Employees designated "SHSS" have completed a 12-hour site safety coordinator course, and have documented requisite field experience. An SHSS with a level designation (D, C, B) equal to or greater than the level of protection being used must be present during all tasks performed in exclusion or decontamination zones. Employees designated "FA-CPR" are currently certified by the American Red Cross, or equivalent, in first aid and CPR. At least one FA-CPR designated employee must be present during all tasks performed in exclusion or decontamination zones. At least two FA-CPR trained employees must be available at each job site/operation. The employees listed below are currently active in a medical surveillance program that meets state and federal regulatory requirements for hazardous waste operations. Certain tasks (e.g., confined-space entry) and contaminants (e.g., lead) may require additional training and medical monitoring.

Pregnant employees are to be informed of and are to follow the procedures in CH2M HILL-SOP HS-04, *Reproduction Protection*, including obtaining a physician's statement of the employee's ability to perform hazardous activities before being assigned fieldwork.

Employee Name	Office	Responsibility	SHSS/FA-CPR

4.2 Field Team Chain of Command and Communication Procedures

4.2.1 Client

Contact Name: U.S. Naval Facilities, Engineering Command, Southern Division
Phone: 254.840.9495

4.2.2 CH2M HILL

Program Manager: Sid Allison
Project Manager: Casey Hudson
Health and Safety Manager: Rich Rathnow
Field Team Leader:
Site Health and Safety Specialist:

The CH2M HILL project manager (PM) is responsible for providing adequate resources (budget and staff) for project-specific implementation of the HS&E management process. The PM has overall management responsibility for the tasks listed below. The PM may explicitly delegate specific tasks to other staff, as described in sections that follow, but retains ultimate responsibility for completion of the following in accordance with this SOP:

- Include standard terms and conditions, and contract-specific HS&E roles and responsibilities in contract and subcontract agreements (including flow-down requirements to lower-tier subcontractors)
- Select safe and competent subcontractors by:
- obtaining, reviewing and accepting or rejecting subcontractor pre-qualification questionnaires
- ensuring that acceptable certificates of insurance, including CH2M HILL as named additional insured, are secured as a condition of subcontract award
- including HS&E submittals checklist in subcontract agreements, and ensuring that appropriate site-specific safety procedures, training and medical monitoring records are reviewed and accepted prior to the start of subcontractor's field operations
- Maintain copies of subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractors license, training and medical monitoring records, and site-specific safety procedures in the project file accessible to site personnel
- Provide oversight of subcontractor HS&E practices per the site-specific safety plan
- Manage the site and interfacing with 3rd parties in a manner consistent with our contract and subcontract agreements and the applicable standard of reasonable care
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented

The CH2M HILL HSM is responsible for:

- Review and accept or reject subcontractor pre-qualification questionnaires that fall outside the performance range delegated to the Contracts Administrator (KA)
- Review and accept or reject subcontractor training records and site-specific safety procedures prior to start of subcontractor's field operations
- Support the SHSS's oversight of subcontractor (and lower-tier subcontractors) HS&E practices and interfaces with on-site 3rd parties per the site-specific safety plan
- The SHSS is responsible for verifying that the project is conducted in a safe manner including the following specific obligations:
- Verify this HSP remains current and amended when project activities or conditions change
- Verify CH2M HILL site personnel and subcontractor personnel read this HSP and sign Attachment 1 "Employee Signoff Form" prior to commencing field activities
- Verify CH2M HILL site personnel and subcontractor personnel have completed any required specialty training (e.g., fall protection, confined space entry) and medical surveillance as identified in Section 2
- Verify compliance with the requirements of this HSP and applicable subcontractor health and safety plan(s)
- Act as the project "Hazard Communication Coordinator" and perform the responsibilities outlined in Section 2.2.2
- Act as the project "Emergency Response Coordinator" and perform the responsibilities outlined in Section 4
- Post OSHA job-site poster; the poster is required at sites where project field offices, trailers, or equipment-storage boxes are established; posters can be obtained by calling 800/548-4776 or 800/999-9111
- Verify that safety meetings are conducted and documented in the project file initially and as needed throughout the course of the project (e.g., as tasks or hazards change)
- Verify that project H&S forms and permits, found in Attachment 5, are being used as outlined in Section 2
- Perform oversight and/or assessments of subcontractor HS&E practices per the site-specific safety plan and verify that project activity self-assessment checklists, found in Attachment 5, are being used as outlined in Section 2
- Verify that project files available to site personnel include copies of executed subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractors license, training and medical monitoring records, and site-specific safety procedures prior to start of subcontractor's field operations

- Manage the site and interfacing with 3rd parties in a manner consistent with our contract/subcontract agreements and the applicable standard of reasonable care
- Coordinate with the HS&E manager regarding CH2M HILL and subcontractor operational performance, and 3rd party interfaces
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented
- The training required for the SHSS is as follows:
- SHSS 10 hour course
- OHSA 10 hour course for Construction
- First Aid and CPR
- Relevant Competent Person Courses (excavation, confined space, scaffold, fall protection, etc.)

The SHSS is responsible for contacting the Field Team Leader and Project Manager. In general, the Project Manager will contact the client. The Health and Safety Manager should be contacted as appropriate.

4.2.3 Subcontractors

(Reference CH2M HILL- SOP HS-55, *Subcontractor, Contractor, and Owner*)

Certain subcontractors (drilling, remedial and construction contractors) are required to be pre-qualified for safety by completing the Subcontractor Safety Performance Questionnaire. The subcontractors listed above are covered by this HSP. However, this plan does not address hazards associated with the tasks and equipment that the subcontractor has expertise in (e.g., drilling, excavation work, electrical). Subcontractors are responsible for the health and safety procedures specific to their work, and are required to submit these procedures to CH2M HILL for review before the start of field work by following the Subcontractor Safety Procedure Criteria specific to their work.

Subcontractors are also required to prepare Activity Hazard Analysis before beginning each activity posing H&S hazards to their personnel using the AHA form provided in Attachment 6 as a guide. The AHA shall identify the principle steps of the activity, potential H&S hazards for each step and recommended control measures for each identified hazard. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified.

Subcontractors must comply with the established health and safety plan(s). The CH2M HILL SHSS should verify that subcontractor employee training, medical clearance, and fit test records are current and must monitor and enforce compliance with the established plan(s). CH2M HILL oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

CH2M HILL should continuously endeavor to observe subcontractors' safety performance. This endeavor should be reasonable, and include observing for hazards or unsafe practices

that are both readily observable and occur in common work areas. CH2M HILL is not responsible for exhaustive observation for hazards and unsafe practices. In addition to this level of observation, the SHSS is responsible for confirming CH2M HILL subcontractor performance against both the subcontractor's safety plan and applicable self-assessment checklists. Self-assessment checklists contained in Attachment 5 are to be used by the SHSS to review subcontractor performance.

Health and safety related communications with CH2M HILL subcontractors should be conducted as follows:

- Brief subcontractors on the provisions of this plan, and require them to sign the Employee Signoff Form included in Attachment 1.
- Request subcontractor(s) to brief project team on the hazards and precautions related to their work.
- When apparent non-compliance/unsafe conditions or practices are observed, notify the subcontractor safety representative and require corrective action – the subcontractor is responsible for determining and implementing necessary controls and corrective actions.
- When repeat non-compliance/unsafe conditions are observed, notify the subcontractor safety representative and stop affected work until adequate corrective measures are implemented.
- When an apparent imminent danger exists, immediately remove all affected CH2M HILL employees and subcontractors, notify subcontractor safety representative, and stop affected work until adequate corrective measures are implemented. Notify the Project Manager and HSM as appropriate.
- Document all oral health and safety related communications in project field logbook, daily reports, or other records.

5.0 Personal Protective Equipment

(Reference CH2M HILL- SOP HS-07, *Personal Protective Equipment*, HS-08, *Respiratory Protection*)

PPE Specifications are listed in Table 5-1.

TABLE 5-1
PPE Specifications[a]

Activity	Level	Body	Head	Respirator [b]
General site entry Oversight of remediation and construction	D	Work clothes; steel-toe, leather work boots; work glove.	Hardhat [c] Safety glasses Ear protection [d]	None required
Free product/ground water gauging/groundwater sampling	Modified D	Work clothes or cotton coveralls **Boots:** Steel-toe, chemical-resistant **Gloves:** chemical-resistant nitrile gloves.	Hardhat [c] Safety glasses Ear protection [d]	None required
	Modified D	**Coveralls:** Uncoated Tyvek® **Boots:** Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers **Gloves:** Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat [c] Splash shield [c] Safety glasses Ear protection [d]	None required.
Tasks requiring upgrade	C	**Coveralls:** Polycoated Tyvek® **Boots:** Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers **Gloves:** Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat [c] Splash shield [c] Ear protection [d] Spectacle inserts	APR, full face, MSA Ultratwin or equivalent; with GME-H cartridges or equivalent[e].
Tasks requiring upgrade	B	**Coveralls:** Polycoated Tyvek® **Boots:** Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers **Gloves:** Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat [c] Splash shield [c] Ear protection [d] Spectacle inserts	Positive-pressure demand self-contained breathing apparatus (SCBA); MSA Ultralite, or equivalent.

Reasons for Upgrading or Downgrading Level of Protection

Upgrade[f]	Downgrade
• Request from individual performing tasks. • Change in work tasks that will increase contact or potential contact with hazardous materials. • Occurrence or likely occurrence of gas or vapor emission. • Known or suspected presence of dermal hazards. • Instrument action levels (Section 5) exceeded.	• New information indicating that situation is less hazardous than originally thought. • Change in site conditions that decreases the hazard. • Change in work task that will reduce contact with hazardous materials.

[a] Modifications are as indicated. CH2M HILL will provide PPE only to CH2M HILL employees.
[b] No facial hair that would interfere with respirator fit is permitted.
[c] Hardhat and splash-shield areas are to be determined by the SHSS.
[d] Ear protection should be worn when conversations cannot be held at distances of 3 feet or less without shouting.
[e] Cartridge change-out schedule is at least every 8 hours (or one work day), except if relative humidity is > 85%, or if organic vapor measurements are > midpoint of Level C range (refer to Section 5)--then at least every 4 hours. If encountered conditions are different than those anticipated in this HSP, contact the HSM.
[f] Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the HSM, and an SHSS qualified at that level is present.

6.0 Air Monitoring/Sampling

(Reference CH2M HILL- SOP HS-06, *Air Monitoring)*

6.1 Air Monitoring Specifications

Air Monitoring Specifications are listed in Table 6-1.

TABLE 6-1
Air Monitoring Specifications

Instrument	Tasks	Action Levels[a]		Frequency [b]	Calibration
PID: OVM or equivalent **(11.7 eV lamp or equivalent)**	All soil intrusive activities where contaminants may potentially be encountered.	<0-1 ppm (in worker BZ)	Modified Level D	Initially during intrusive activities and where unusual odors vapors or fumes, discolored soil/sediment are observed/ encountered.	Daily
		1 - 5 ppm (sustained 5 mins in worker BZ)	Level C with Benzene, detector tube monitoring **or** Suspend operations and allow vapors to dissipate to < 1 ppm before continuing in Level D. If Benzene is negative proceed with work in Level D up to 5 ppm	Continuously or until 1) level is below 1 ppm, 2) Compound specific action level is exceeded.	
		> 5 ppm (sustained 5 mins. in worker BZ)	Level C or Suspend operations and allow vapors to dissipate to < 5 ppm before continuing in Level D continue with Benzene monitoring. If levels persist for Benzene to Level B will be required. Consult HSM for proper engineering controls and PPE requirements or before any investigation of "unknown" conditions.	Continuously upon re-start of work to verify 0-1 ppm in worker BZ and until it is determined that compound specific concentrations are less than 50% of the PEL or REL.	
Dust Monitor Visual Assessment	All activities	No Visible DustVisible Dust	Level D Use dust suppression methods	Initially and periodically during tasks	Zero Daily
Noise-Level Monitor [e]:	All activities	<85 dB(A) 85-120 dB(A) 120 dB(A)	No action required Hearing protection required Stop; re-evaluate	Initially and periodically during task	Daily

[a] Action levels apply to sustained breathing-zone measurements above background.
[b] The exact frequency of monitoring depends on field conditions and is to be determined by the SHSS; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time, measurement results, personnel monitored, and place/location where measurement is taken (e.g., "Breathing Zone/MW-3", "at surface/SB-2", etc.).
[c] If the measured percent of O_2 is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O_2 action levels apply only to ambient working atmospheres, and not to confined-space entry. More-stringent percent LEL and O_2 action levels are required for confined-space entry (refer to Section 2).
[d] Refer to SOP HS-10 for instructions and documentation on radiation monitoring and screening.
[e] Noise monitoring and audiometric testing also required.

6.2 Calibration Specifications

(Refer to the respective manufacturer's instructions for proper instrument-maintenance procedures)

Air Monitoring equipment calibration specifications are listed in Table 6-2

TABLE 6-2
Air Monitoring Equipment Calibration Specifications

Instrument	Gas	Span	Reading	Method
PID: OVM, 10.6 or 11.8 eV bulb	100 ppm isobutylene	RF = 1.0	100 ppm	1.5 lpm reg T-tubing
PID: MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF = 100	100 ppm	1.5 lpm reg T-tubing
PID: TVA 1000	100 ppm isobutylene	CF = 1.0	100 ppm	1.5 lpm reg T-tubing
FID: OVA	100 ppm methane	3.0 $\pm$ 1.5	100 ppm	1.5 lpm reg T-tubing
FID: TVA 1000	100 ppm methane	NA	100 ppm	2.5 lpm reg T-tubing
Dust Monitor: Miniram-PDM3	Dust-free air	Not applicable	0.00 mg/m^3 in "Measure" mode	Dust-free area OR Z-bag with HEPA filter
CGI: MSA 260, 261, 360, or 361	0.75% pentane	N/A	50% LEL $\pm$ 5% LEL	1.5 lpm reg direct tubing

6.3 Air Sampling

Sampling, in addition to real-time monitoring, may be required by other OSHA regulations where there may be exposure to certain contaminants. Air sampling typically is required when site contaminants include lead, cadmium, arsenic, asbestos, and certain volatile organic compounds. Contact the HSM immediately if these contaminants are encountered.

7.0 Decontamination

(Reference CH2M HILL- SOP HS-13, *Decontamination*)

The SHSS must establish and monitor the decontamination procedures and their effectiveness. Decontamination procedures found to be ineffective will be modified by the SHSS. The SHSS must ensure that procedures are established for disposing of materials generated on the site.

7.1 Decontamination Specifications

Personnel	Sample Equipment	Heavy Equipment
• Boot wash/rinse • Glove wash/rinse • Outer-glove removal • Body-suit removal • Inner-glove removal • Respirator removal • Hand wash/rinse • Face wash/rinse • Shower ASAP • Dispose of PPE in municipal trash, or contain for disposal • Dispose of personnel rinse water to facility or sanitary sewer, or contain for offsite disposal	• Wash/rinse equipment • Solvent-rinse equipment • Contain solvent waste for offsite disposal	• Power wash • Steam clean • Dispose of equipment rinse water to facility or sanitary sewer, or contain for offsite disposal

7.2 Diagram of Personnel-Decontamination Line

No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SHSS should establish areas for eating, drinking, and smoking. Contact lenses are not permitted in exclusion or decontamination zones.

Figure 7-1 illustrates a conceptual establishment of work zones, including the decontamination line. Work zones are to be modified by the SHSS to accommodate task-specific requirements.

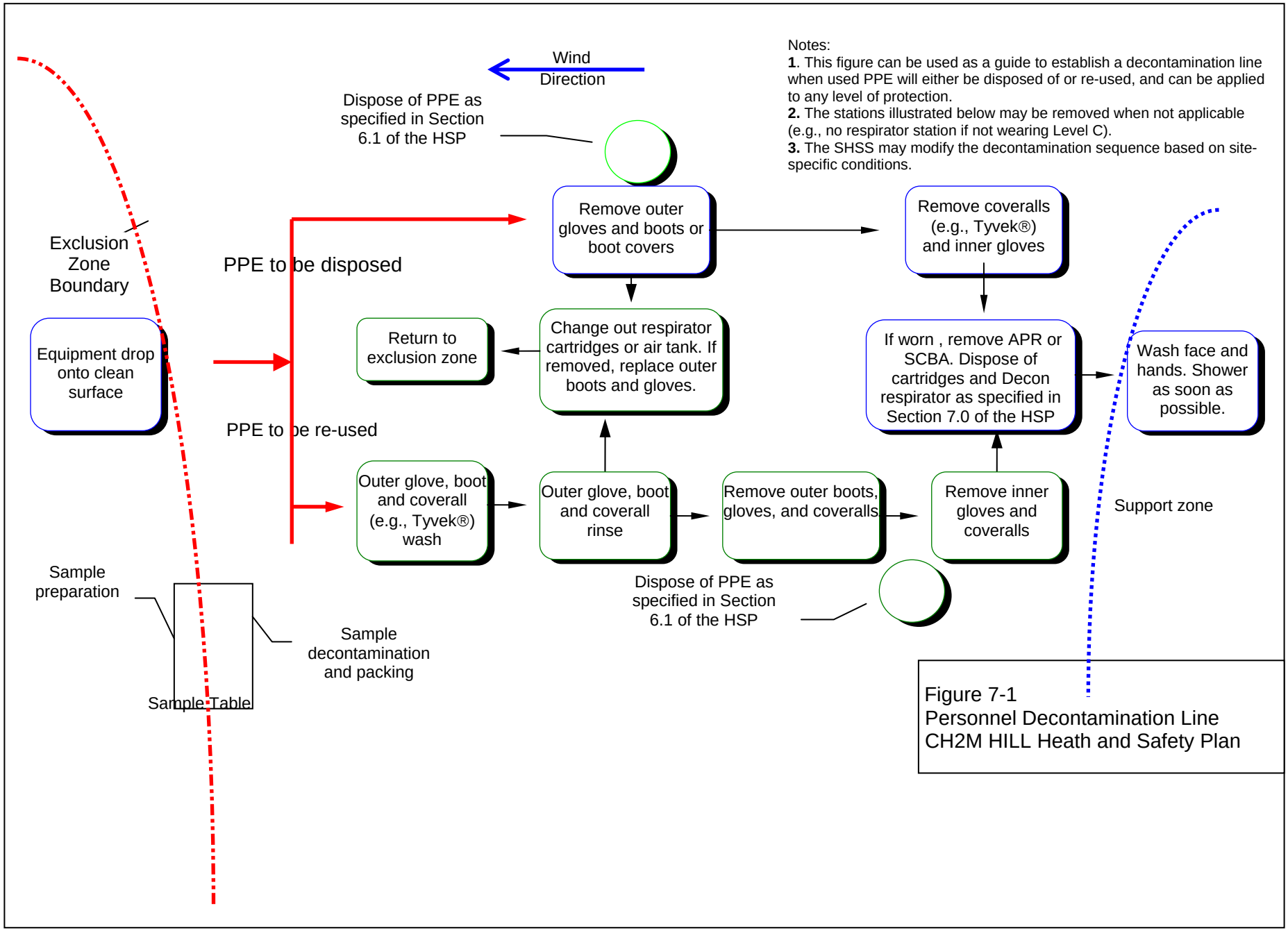


Figure 7-1
Personnel Decontamination Line
CH2M HILL Heath and Safety Plan

8.0 Spill-Containment Procedures

Sorbent material will be maintained in the support zone. Incidental spills will be contained with sorbent and disposed of properly.

9.0 Site-Control Plan

9.1 Site-Control Procedures

(Reference CH2M HILL- SOP HS-11, *Site Control)*

- The SHSS will conduct a site safety briefing (see below) before starting field activities or as tasks and site conditions change.
- Topics for briefing on site safety: general discussion of Health and Safety Plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, emergencies.
- The SHSS records attendance at safety briefings in a logbook and documents the topics discussed.
- Post the OSHA job-site poster in a central and conspicuous location in accordance with CH2M HILL- SOP HS-71, OSHA Postings.
- Establish support, decontamination, and exclusion zones. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Establish onsite communication consisting of the following:
    - Line-of-sight and hand signals
    - Air horn
    - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the "buddy system."
- Initial air monitoring is conducted by the SHSS in appropriate level of protection.
- The SHSS is to conduct periodic inspections of work practices to determine the effectiveness of this plan (refer to Sections 2 and 3). Deficiencies are to be noted, reported to the HSM, and corrected.

9.2 Hazwoper Compliance Plan

(Reference CH2M HILL- SOP HS-19, *Site-Specific Written Safety Plans)*

Certain parts of the site work are covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated Hazwoper tasks might occur consecutively or concurrently with respect to non-Hazwoper tasks. This section outlines procedures to be followed when approved activities do not require 24- or 40-hour training. Non-Hazwoper-trained personnel also must be trained in accordance with all other state and federal OSHA requirements.

- In many cases, air sampling, in addition to real-time monitoring, must confirm that there is no exposure to gases or vapors before non-Hazwoper-trained personnel are allowed on the site, or while non-Hazwoper-trained staff are working in proximity to Hazwoper activities. Other data (e.g., soil) also must document that there is no potential for exposure. The HSM must approve the interpretation of these data.
- When non-Hazwoper-trained personnel are at risk of exposure, the SHSS must post the exclusion zone and inform non-Hazwoper-trained personnel of the:
  - nature of the existing contamination and its locations
  - limitations of their access
  - emergency action plan for the site
- Periodic air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-Hazwoper-trained personnel (e.g., in an adjacent area) are not exposed to airborne contaminants.
- When exposure is possible, non-Hazwoper-trained personnel must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.
- Remediation treatment system start-ups: Once a treatment system begins to pump and treat contaminated media, the site is, for the purposes of applying the Hazwoper standard, considered a treatment, storage, and disposal facility (TSDF). Therefore, once the system begins operation, only Hazwoper-trained personnel (minimum of 24 hours of training) will be permitted to enter the site. All non-Hazwoper-trained personnel must not enter the TSDF area of the site.

10.0 Emergency Response Plan

(Reference CH2M HILL- SOP HS-12, *Emergency Response*)

10.1 Pre-Emergency Planning

The SHSS performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with CH2M HILL onsite parties, the facility, and local emergency-service providers as appropriate.

- Review the facility emergency and contingency plans where applicable.
- Determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Determine what offsite communication equipment is needed (e.g., nearest telephone, cell phone).
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- Field Trailers: Post "Exit" signs above exit doors, and post "Fire Extinguisher" signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, and releases.
- Rehearse the emergency response plan before site activities begin, including driving route to hospital.
- Brief new workers on the emergency response plan.
- The SHSS will evaluate emergency response actions and initiate appropriate follow-up actions.

10.2 Emergency Equipment and Supplies

The SHSS should mark the locations of emergency equipment on the site map and post the map.

Emergency Equipment and Supplies	Location
20 LB (or two 10-lb) fire extinguisher (A, B, and C classes)	Support Zone/Heavy Equipment
First aid kit	Support Zone/Field Vehicle
Eye Wash	Support & Decon Zone/Field Vehicle
Potable water	Support & Decon Zone/Field Vehicle
Bloodborne-pathogen kit	Support Zone/Field Vehicle

10.3 Incident Reporting, Investigation and Response

For any accident meeting the definition of Recordable Occupational Injuries or Illnesses or Significant Accidents, the Southern Division, NAVFAC Contracting Officer and Navy Technical Representative (NTR) shall be notified by the HSM or Program Manager soon as practical, but not later than four hours after occurrence. All other incidents must be reported to Southern Division, NAVFAC within 24 hours of incident occurrence.

Therefore in order for the incident to be assessed for reportability purposes it is imperative that according to CH2M HILL requirements, all personal injuries, near-misses, or property damage incidents involving CH2M HILL or subcontractor project personnel be reported IMMEDIATELY to the HSM Rich Rathnow/ORO, Program Manager Scott Newman/ATL, or CH2M HILL Corporate HSM Angelo Liberatore/ATL at the numbers identified in the emergency contact attachment contained in this plan.

The Site Manager or designee must report the following incident information to the HSM immediately after incident occurrence:

- Date and time of mishap
- Project name and project number
- Name and worker classification
- Extent of known injuries
- Level of medical attention
- Injury cause

A written incident investigation shall be performed and submitted to the HSM within 24 hours of incident occurrence by the completing the Incident Report, Near Loss Investigation and Root Cause Analysis provided in the HSP Attachments.

In fires, explosions, or chemical releases, actions to be taken include the following:

Shut down CH2M HILL operations and evacuate the immediate work area.
Notify appropriate response personnel.
Account for personnel at the designated assembly area(s).

Assess the need for site evacuation, and evacuate the site as warranted.

Instead of implementing a work-area evacuation, note that small fires or spills posing minimal safety or health hazards may be controlled.

10.4 Emergency Medical Treatment

The procedures listed below may also be applied to non-emergency incidents. CH2M HILL employee injuries and illnesses must be reported to the Human Resource contact in Attachment 4. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the CH2M HILL medical consultant, depending on whose employee is injured. During non-emergencies, follow these procedures as appropriate.

- Notify appropriate emergency response authorities (e.g., 911).
- The SHSS will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury.
- Initiate first aid and CPR where feasible.
- Get medical attention immediately.
- Perform decontamination where feasible; lifesaving and first aid or medical treatment take priority.
- Make certain that the injured person is accompanied to the emergency room.
- When contacting the medical consultant, give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.
- Report incident as outlined in Section 10.7.

10.5 Evacuation

- Evacuation routes and assembly areas (and alternative routes and assembly areas) are specified on the site map.
- Evacuation route(s) and assembly area(s) will be designated by the SHSS before work begins.
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.
- The SHSS and a "buddy" will remain on the site after the site has been evacuated (if safe) to assist local responders and advise them of the nature and location of the incident.
- The SHSS will account for all personnel in the onsite assembly area.

- A designated person will account for personnel at alternate assembly area(s).
- The SHSS will write up the incident as soon as possible after it occurs and submit a report to the Corporate Director of Health and Safety.

10.6 Evacuation Signals

Signal	Meaning
Grasping throat with hand	Emergency-help me.
Thumbs up	OK; understood.
Grasping buddy's wrist	Leave area now.
Continuous sounding of horn	Emergency; leave site now.

10.7 Incident Notification and Reporting

- Upon any project incident (fire, spill, injury, near miss, death, etc.), immediately notify the PM and HSM. Call emergency beeper number if HSM is unavailable.
- For CH2M HILL work-related injuries or illnesses, contact the respective Human Resources contact listed in Attachment 4. For CH2M HILL incidents the HR administrator completes an Incident Report Form (IRF). IRF must be completed within 24 hours of incident.
- For CH2M HILL subcontractor incidents, complete the Subcontractor Accident/Illness Report Form and submit to the HSM.
- Notify and submit reports to client as required in contract.

11.0 Behavior Based Loss Prevention System

A Behavior Based Loss Prevention System (BBLPS) is a system to prevent or reduce losses using behavior-based tools and proven management techniques to focus on behaviors or acts that could lead to losses.

The four basic Loss Prevention tools that will be used on EE&S CH2M HILL projects to implement the BBLPS include:

- Activity Hazard Analysis (AHA)
- Pre-Task Safety Plans (PTSP)
- Loss Prevention Observations (LPO)
- Loss and Near Loss Investigations (NLI)

The Site Supervisor serves as the Site Health and Safety Specialist (SHSS) and is responsible for implementing the BBLPS on the project site. When a separate individual is assigned as the SHSS, the SHSS is delegated authority from the Site Supervisor to implement the BBLPS on the project site, but the Site Supervisor remains accountable for its implementation. The Site Supervisor/Safety Coordinator shall only oversee the subcontractor's implementation of their AHAs and PTSPs processes on the project.

11.1 Activity Hazard Analysis

An Activity Hazard Analysis (AHA) defines the activity being performed, the hazards posed and control measures required to perform the work safely. Workers are briefed on the AHA before doing the work and their input is solicited prior, during and after the performance of work to further identify the hazards posed and control measures required.

Activity Hazard Analysis will be prepared before beginning each project activity posing H&S hazards to project personnel using the AHA form provided in Attachment 6. The AHA shall identify the work tasks required to perform each activity, along with potential H&S hazards and recommended control measures for each work task. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified.

An AHA shall be prepared for all field activities performed by CH2M HILL and subcontractor during the course of the project by the Site Supervisor/SHSS. The Project-Specific and General Hazards of the HSP, the Hazard Analysis Table (Table 2-1), and applicable CH2M HILL Standards of Practice (SOPs) should be used as a basis for preparing CH2M HILL AHAs.

CH2M HILL subcontractors are required to provide AHAs specific to their scope of work on the project for acceptance by CH2M HILL. Each subcontractor shall submit AHAs for their field activities, as defined in their work plan/scope of work, along with their project-specific HSP. Additions or changes in CH2M HILL or subcontractor field activities, equipment, tools or material to perform work or additional/different hazard encountered that require

additional/different hazard control measures requires either a new AHA to be prepared or an existing AHA to be revised.

11.2 Pre-Task Safety Plans

Daily safety meetings are held with all project personnel in attendance to review the hazards posed and required H&S procedures/AHAs, that apply for each day's project activities. The PTSPs serve the same purpose as these general assembly safety meetings, but the PTSPs are held between the crew supervisor and their work crews to focus on those hazards posed to individual work crews. At the start of each day's activities, the crew supervisor completes the PTSP, provided in Attachment 6, with input from the work crew, during their daily safety meeting. The day's tasks, personnel, tools and equipment that will be used to perform these tasks are listed, along with the hazards posed and required H&S procedures, as identified in the AHA. The use of PTSPs, better promotes worker participation in the hazard recognition and control process, while reinforcing the task-specific hazard and required H&S procedures with the crew each day. The use of PTSPs is a common safety practice in the construction industry.

11.3 Loss Prevention Observations

Loss Prevention Observations (LPOs) shall be conducted by Site Supervisor/SHSS for specific work tasks or operations comparing the actual work process against established safe work procedures identified in the project-specific HSP and AHAs. LPOs are a tool to be used by supervisors to provide positive reinforcement for work practices performed correctly, while also identifying and eliminating deviations from safe work procedures that could result in a loss. Site Supervisor/SHSS shall perform at least one LPO each week for a tasks/operations addressed in the project-specific HSP or AHA. The Site Supervisor/SHSS shall complete the LPO form in Attachment 6 for the task/operation being observed.

11.4 Loss/Near Loss Investigations

Loss/Near Loss Investigations shall be performed for the all CH2M HILL and subcontractor incidents involving:

- Person injuries/illnesses and near miss injuries
- Equipment/property damage
- Spills, leaks, regulatory violations
- Motor vehicle accidents

The cause of loss and near loss incidents are similar, so by identifying and correcting the causes of near loss causes, future loss incidents may be prevented. The following is the Loss/Near Loss Investigation Process:

- Gather all relevant facts, focusing on fact-finding, not fault-finding, while answering the who, what, when, where and how questions.

- Draw conclusions, pitting facts together into a probable scenario.

- Determine incident root cause(s), which are basic causes on why an unsafe act/condition existed.
- Develop and implement solutions, matching all identified root causes with solutions.
- Communicate incident as a Lesson Learned to all project personnel.
- Filed follow-up on implemented corrective active action to confirm solution is appropriate.

Site Supervisors/SHSS shall perform an incident investigation, as soon as practical after incident occurrence during the day of the incident, for all Loss and Near Loss Incidents that occur on the project. Loss and Near Loss incident investigations shall be performed using the following incident investigation forms provided in Attachment 6:

- Incident Report Form (IRF)
- Incident Investigation Form
- Root Cause Analysis Form

All Loss and Near Loss incident involving personal injury, property damage in excess of $1,000 or near loss incidents that could have resulted in serious consequences shall be investigated by completing the incident investigation forms and submitting them to the PM and HSM within 24 hours of incident occurrence. A preliminary Incident Investigation and Root Cause Analysis shall be submitted to the Project Manager and HSM within 24 hours of incident occurs. The final Incident Investigation and Root Cause Analysis shall be submitted after completing a comprehensive investigation of the incident.

12.0 Approval

This site-specific Health and Safety Plan has been written for use by CH2M HILL only. CH2M HILL claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if those conditions change.

12.1 Original Plan

Written By: Teresa Offner **Date: March 28, 2008**

Approved By: **Rich Rathnow** **Date: April 26, 2008**

12.2 Revisions

Revisions Made By: **Date:**

Revisions to Plan:

Revisions Approved By: **Date:**

Attachment 1

Employee Signoff Form

EMPLOYEE SIGNOFF FORM

Health and Safety Plan

The CH2M HILL project employees and subcontractors listed below have been provided with a copy of this HSP, have read and understood it, and agree to abide by its provisions.

Project Name: NAS Pensacola **Project Number:** 371255

EMPLOYEE NAME (Please print)	**EMPLOYEE SIGNATURE**	**COMPANY**	**DATE**

Attachment 2

Project-Specific Chemical Product Hazard Communication Form

Project-Specific Chemical Product Hazard Communication Form

This form must be completed prior to performing activities that expose personnel to hazardous chemicals products. Upon completion of this form, the SHSS shall verify that training is provided on the hazards associated with these chemicals and the control measures to be used to prevent exposure to CH2M HILL and subcontractor personnel. Labeling and MSDS systems will also be explained.

Project Name: NAS Pensacola **Project Number:** 371255

MSDSs will be maintained at the following location(s): Site

Hazardous Chemical Products Inventory

Chemical	Quantity	Location	MSDS Available	Container labels	
				Identity	Hazard
Methane	1 liter, compressed	Support Zone			
Isobutylene	1 liter, compressed	Support Zone			
Pentane	1 liter, compressed	Support Zone			
Hydrochloric acid	< 500 ml	Support Zone / sample bottles			
Nitric acid	< 500 ml	Support Zone / sample bottles			
Sulfuric Acid	< 500 ml	Support Zone / sample bottles			
Sodium hydroxide	< 500 ml	Support Zone / sample bottles			
Methanol	< 1 Gallon	Support/Decon Zones			
Hexane	< 1 Gallon	Support/Decon Zones			
pH buffers	< 500 ml	Support Zone			
MSA Sanitizer	< 1 liter	Support/Decon Zones			
Alconox/Liquinox	< 1liter	Support/Decon Zones			

Refer to SOP HS-05 *Hazard Communication* for more detailed information.

Attachment 3

Chemical Specific Training Form

CHEMICAL-SPECIFIC TRAINING FORM

Location: Naval Air Station Pensacola, Pensacola, FL Project # :371255

SHSS: Trainer:

TRAINING PARTICIPANTS:

NAME	SIGNATURE	NAME	SIGNATURE

REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:

The HCC shall use the product MSDS to provide the following information concerning each of the products listed above.

☐ Physical and health hazards

☐ Control measures that can be used to provide protection (including appropriate work practices, emergency procedures, and personal protective equipment to be used)

☐ Methods and observations used to detect the presence or release of the regulated product in the workplace (including periodic monitoring, continuous monitoring devices, visual appearance or odor of regulated product when being released, etc.)

Training participants shall have the opportunity to ask questions concerning these products and, upon completion of this training, will understand the product hazards and appropriate control measures available for their protection.

Copies of MSDSs, chemical inventories, and CH2M HILL's written hazard communication program shall be made available for employee review in the facility/project hazard communication file.

Attachment 4

Emergency Contacts

Emergency Contacts-

24-hour CH2M HILL Emergency Beeper – 888/444-1226

Medical Emergency – 911
Facility Medical Response #: 911
Local Ambulance #:

CH2M HILL- Medical Consultant
Dr. Jerry H. Berke, M.D., M.P.H.
Health Resources
600 West Cummings Park, Suite 3400
Woburn, MA 01801-6350
781/938-4653
800/350-4511
(After hours calls will be returned within 20 minutes)

Fire/Spill Emergency -- 911
Facility Fire Response #: 911
Local Fire Dept #:

Local Occupational Physician

Security & Police – 911
Facility Security #: 911
Local Police #: 254-840-2855

Navy RAC Program Manager
Name: Sidney Allison/CLT
Phone: 770/604/9182

Utilities Emergency
Water:
Gas:
Electric:

Navy RAC Health and Safety Manager (HSM)
Name: Rich Rathnow/ORO
Phone: 865/483-9005 (Office); 865/607-6734 (Cell)
865/531-2933 (Home)

Site Health and Safety Specialist (SHSS)
Name:
Phone:

CH2M HILL Human Resources Department
Name: Nancy Orr/COR
Phone: 303/771-0952

Project Manager
Name: Casey Hudson
Phone:

Corporate Human Resources Department
Name: John Monark/COR
Phone: 303/771-0900

Federal Express Dangerous Goods Shipping
Phone: 800/238-5355
Emergency Number for Shipping Dangerous Goods
Phone: 800/255-3924

CH2M HILL Worker's Compensation and Auto Claims
Sterling Administration Services
Phone: 800/420-8926 After hours: 800/497-4566

Report fatalities AND report vehicular accidents involving pedestrians, motorcycles, or more than two cars.

Contact the Project Manager. Generally, the Project Manager will contact relevant government agencies.

Facility Alarms: NA

Evacuation Assembly Area(s):

Facility/Site Evacuation Route(s):

Hospital Name/Address:
Providence Hospital

Hospital Phone #: 254-751-4000

Directions to Hospital

See map

Attachment 6

Behavior Based Loss Prevention System Forms

Activity Hazard Analysis
Pre-Task Safety Plans
Loss Prevention Observation
Incident Report and Investigation

Activity Hazard Form

Activity:	**Date:**
	Project:
Description of the work:	**Site Supervisor:**
	Site Safety Officer:
	Review for latest use: Before the job is performed.

Work Tasks	Identify & Analyze the Hazards	Identify Hazard Controls

Work Tasks	Identify & Analyze the Hazards	Identify Hazard Controls

Equipment to be used	Inspection Requirements	Training Requirements

PRINT	SIGNATURE		
Supervisor Name:			Date/Time:
Safety Officer Name:			Date/Time:
Employee Name(s):			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:

CH2MHILL PRE-TASK SAFETY PLAN

Project: _____ Location: _____Date:_____

Supervisor: _____Emergency Number(s):_____

Brief Job Descriptions:

1._____
2._____
3._____
4._____
5._____

List Specific Tasks for the Jobs (Match number from above).

1._____
2._____
3._____
4._____
5._____

Tools/Equipment required for Tasks, (ladders, scaffolds, fall protection, cranes/rigging, heavy equipment, power tools)match number from above:

1._____
2._____
3._____
4._____
5._____

Potential H&S Hazards, including chemical, physical, safety, biological and environmental **(Check all that apply and review exposures as they will be encountered in the tasks above):**

__ Chemical burns/contact	__ Trench, excavations, cave-ins	__Ergonomics
__ Pressurized lines/equipment	__ Overexertion	__ Chemical splash
__ Thermal burns	__ Pinch points	__ Poisonous plants/insects
__ Electrical	__ Cuts/abrasions	___Eye hazards/flying projectile
__ Weather conditions	__ Spills	__ Inhalation hazard
__Heights/fall> 6′	__ Overhead Electrical hazards	__ Heat/cold stress
__ Noise	__ Elevated loads	__ Water/drowning hazard
__ Explosion/fire	__ Slips, trip and falls	__ Heavy equipment
__Radiation	__ Manual lifting	__ Aerial lifts/platforms
__ Confined space entry	__Welding/cutting	__ Demolition

Other Potential Hazards (Describe):

_____

CH2MHILL PRE-TASK SAFETY PLAN

Hazard Control Measures (Check all that apply):			
PPE __ Thermal/lined __ Eye __ Dermal/hand __ Hearing __ Respiratory __ Reflective vests __ Flotation device	Protective Systems __ Sloping __ Shoring __ Trench box __ Barricades __ Competent person __ Locate buried utilities __ Daily inspections	Fire Protection __ Fire extinguishers __ Fire watch __ Non-spark tools __ Grounding/bonding __ Intrinsically safe equipment	Electrical __ Lockout/tagout __ Grounded __ Panels covered __ GFCI/extension cords __ Power tools/cord inspected
Fall Protection __ Harness/lanyards __ Adequate anchorage __ Guardrail system __ Covered opening __ Fixed barricades __ Warning system	Air Monitoring __ PID/FID __ Detector tubes __ Radiation __ Personnel sampling __ LEL/O2 __ Other	Proper Equipment __ Aerial lift/ladders/scaffolds __ Forklift/ Heavy equipment __ Backup alarms __ Hand/power tools __ Crane w/current inspection __ Proper rigging __ Operator qualified	Welding & Cutting __ Cylinders secured/capped __ Cylinders separated/upright __ Flash-back arrestors __ No cylinders in CSE __ Flame retardant clothing __ Appropriate goggles
Confined Space Entry __ Isolation __ Air monitoring __ Trained personnel __ Permit completed __ Rescue	Medical/ER __ First-aid kit __ Eye wash __ FA-CPR trained personnel __ Route to hospital	Heat/Cold Stress __ Work/rest regime __ Rest area __ Liquids available __ Monitoring __ Training	Vehicle/Traffic __ Traffic control __ Barricades __ Flags __ Signs
Permits __ Hot work __ Confined space __ Lockout/tagout __ Excavation __ Demolition __ Energized work	Demolition __ Pre-demolition survey __ Structure condition __ Isolate area/utilities __ Competent person __ Hazmat present	Inspections: __ Ladders/aerial lifts __ Lanyards/harness __ Scaffolds __ Heavy equipment __Cranes and rigging	Training: __ Hazwaste __ Construction __ Competent person __ Task-specific (THA) __ Hazcom
FieldNotes:_____ _____			

Supervisor signature:_____ Date:_____

List employees who reviewed hazards identified per the checklist.

Print Name	Badge No.	Signature	SS# (Unbadged Personnel)

CH2MHILL

LOSS PREVENTION OBSERVATION

Project:	Supervisor:	Date:
_____	_____	_____

Task/Operation Observed:	Job Title of Worker Observed:
_____ _____ _____	_____ _____
Background Information/comments:	Task Hazard Analysis completed for task (Y/N):
_____ _____ _____	_____

Positive Observations/Safe Work Procedures

1._____

2._____

3._____

4._____

Questionable Activity/Unsafe Condition Observed

1._____

2._____

3._____

Observed Worker's Comment(s)

1._____

2._____

3._____

4._____

Supervisor's Corrective Actions Taken:

1._____

2._____

3._____

4._____

CH2MHILL

Loss Investigation Report Form

Employer Information

Project Name: _____ Project Number: _____

Project Location:

_____

CHIL Project? Yes ☐ No ☐

Task Location:

_____

Job Assignment: _____ Business Group: _____

Preparer's Name: _____ Preparer's Employee Number: _____

Near Loss Incident Specific Information

Date of Incident: _____ Time of Incident: _____ a.m./p.m.

Location of incident:

☐Company premises
☐Field
☐In Transit
☐Other:_____

Address where the incident occurred:

_____

Equipment Malfunction : Yes ☐ No ☐
Activity was a Routine Task: Yes ☐ No ☐

Describe any property damage:

_____

Specific activity the employee was engaged in when the incident occurred:

_____
_____
_____
_____

All equipment, materials, or chemicals the employee was using when the incident occurred:

_____
_____
_____
_____

Describe the specific incident and how it occurred:

_____
_____
_____
_____

Describe how this incident may have been prevented:
_____
_____
_____

Contributing Factors (Describe in detail why incident occurred):
_____
_____
_____

Date employer notified of incident: _____ To whom reported: _____

Witness Information (First Witness)
Name: _____
Employee Number (for CH2M HILL employees):
_____
Address: _____
City: _____
Zip Code : _____
Phone: _____

Witness Information (Second Witness)
Name: _____
Employee Number (for CH2M HILL employees): _____
Address: _____
City: _____
Zip Code: _____
Phone : _____

Additional information or
comments:_____
_____
_____

COMPLETE ROOT CAUSE ANALYSIS FORM

Root Cause Analysis Form

Root Cause Analysis (RCA)

Lack of skill or knowledge
Lack of or inadequate operational procedures or work standards
Inadequate communication of expectations regarding procedures or work standards
Inadequate tools or equipment
Correct way takes more time and/or requires more effort
Short cutting standard procedures is positively reinforced or tolerated
Person thinks there is no personal benefit to always doing the job according to standards
Uncontrollable

RCA #	Solution(s): How to Prevent Loss From Occurring	RC[1]	CF[2]	Corrective Action Lead	Due Date	Completion Date	Date Verified

[1] RC = Root Cause; [2] CF = Contributing Factors (check which applies)

Investigation Team Members

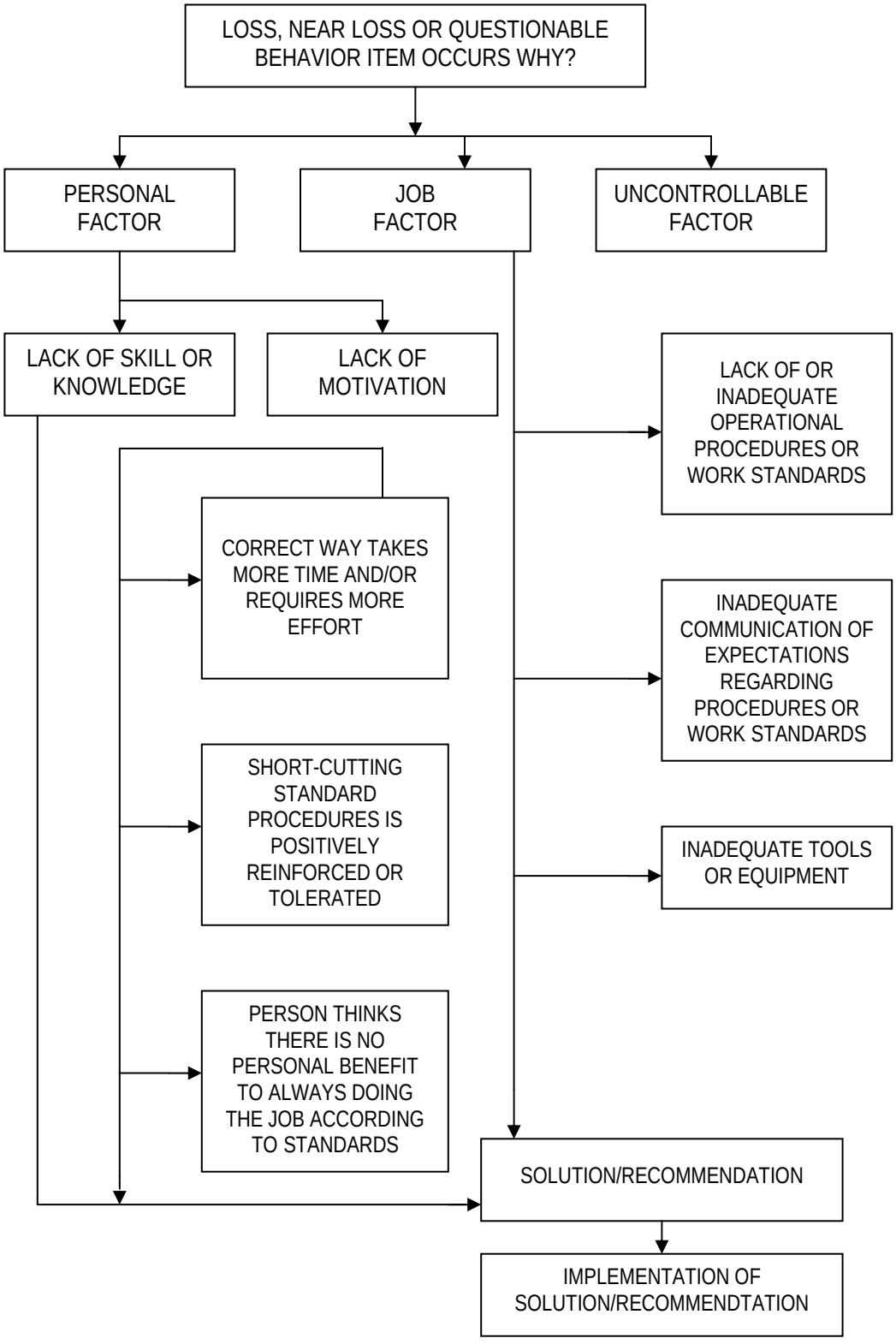
Name	Job Title	Date

Results of Solution Verification and Validation

Reviewed By

Name	Job Title	Date

Root Cause Analysis Flow Chart



Determination of Root Cause(s)

For minor losses or near losses the information may be gathered by the supervisor or other personnel immediately following the loss. Based on the complexity of the situation, this information may be all that is necessary to enable the investigation team to analyze the loss, to determine the root cause, and to develop recommendations. More complex situations may require the investigation team to revisit the loss site or re-interview key witnesses to obtain answers to questions that may arise during the investigation process.

Photographs or videotapes of the scene and damaged equipment should be taken from all sides and from various distances. This point is especially important when the investigation team will not be able to review the loss scene.

The investigation team must use the Root Cause Analysis Flow Chart to assist in identifying the root cause(s) of a loss. Any loss may have one or more "root causes" and "contributing factors". The "root cause" is the primary or immediate cause of the incident, while a "contributing factor" is a condition or event that contributes to the incident happening, but is not the primary cause of the incident. Root causes and contributing factors that relate to the *person* involved in the loss, his or her peers, or the supervisor should be referred to as "personal factors". Causes that pertain to the *system* within which the loss or injury occurred should be referred to as "job factors".

<u>Personal Factors</u>

Lack of skill of knowledge
Correct way takes more time and/or requires more effort
Short-cutting standard procedures is positively reinforced or tolerated
Person thinks that there is no personal benefit to always doing the job according to standards

<u>Job Factors</u>

Lack of or inadequate operational procedures or work standards.
Inadequate communication of expectations regarding procedures or standards
Inadequate tools or equipment

The root cause(s) could be any one or a combination of these seven possibilities or some other "uncontrollable factor". In the vast majority of losses, the root cause is very much related to one or more of these seven factors. Uncontrollable factors should be used rarely and only after a thorough review eliminates "all" seven other factors.

Incident Report Form

Fax completed form to:
425.462.5957
CH2M HILL Seattle Office
Attention: Corporate HS&E Department

Type of Incident (Select at least one)

- ☐ Injury/Illness
- ☐ Property Damage
- ☐ Spill/Release
- ☐ Environmental/Permit Issue
- ☐ Near Miss
- ☐ Other

General Information (Complete for all incident types)

Preparer's Name: _____ Preparer's Employee Number: _____
Date of Report: _____ Date of Incident: _____ Time of Incident: _____ am/pm

Type of Activity (Provide activity being performed that resulted in the incident)

- ☐ Asbestos Work
- ☐ Confined Space Entry
- ☐ Construction Mgmt- Haz Waste
- ☐ Construction Mgmt - Non-Haz Waste
- ☐ Demolition
- ☐ Drilling-Haz Waste
- ☐ Drilling-Non Haz Waste
- ☐ Drum Handling
- ☐ Electrical Work
- ☐ Excavation Trench-Haz Waste
- ☐ Excavation Trench-Non Haz
- ☐ Facility Walk Through
- ☐ General Office Work
- ☐ Keyboard Work
- ☐ Laboratory
- ☐ Lead Abatement
- ☐ Motor Vehicle Operation
- ☐ Moving Heavy Object
- ☐ Other (Specify) _____
- ☐ Process Safety Management
- ☐ Tunneling
- ☐ Welding
- ☐ Wetlands Survey
- ☐ Working from Heights
- ☐ Working in Roadways
- ☐ WWTP Operation

Location of Incident (Select one)

- ☐ Company Premises (CH2M HILL Office: _____)
- ☐ Field (Project #: _____ Project/Site Name: _____ Client: _____)
- ☐ In Transit (Traveling from: _____ Traveling to: _____)
- ☐ At Home

Geographic Location of Incident (Select region where the incident occurred)

- ☐ Northeast
- ☐ Southeast
- ☐ Northwest
- ☐ Southwest
- ☐ Corporate
- ☐ Canadian
- ☐ Asia Pacific
- ☐ Europe Middle East
- ☐ Latin America

If a CH2M HILL subcontractor was involved in the incident, provide their company name and phone number: _____

Describe the Incident (Provide a brief description of the incident): _____

_____

_____

Injured Employee Data (Complete for Injury/Illness incidents only)

If CH2M HILL employee injured
Employee Name: _____ Employee Number: _____

If CH2M HILL Subcontractor employee injured
Employee Name: _____ Company: _____

Injury Type

- ☐ Allergic Reaction
- ☐ Amputation
- ☐ Asphyxia
- ☐ Bruise/Contusion/Abrasion
- ☐ Burn (Chemical)
- ☐ Burn/Scald (Heat)
- ☐ Cancer
- ☐ Carpal Tunnel
- ☐ Concussion
- ☐ Cut/Laceration
- ☐ Dermatitis
- ☐ Dislocation
- ☐ Electric Shock
- ☐ Foreign Body in eye
- ☐ Fracture
- ☐ Freezing/Frost Bite
- ☐ Headache
- ☐ Hearing Loss
- ☐ Heat Exhaustion
- ☐ Hernia
- ☐ Infection
- ☐ Irritation to eye
- ☐ Ligament Damage
- ☐ Multiple (Specify)

  _____
- ☐ Muscle Spasms
- ☐ Other (Specify)

  _____
- ☐ Poisoning (Systemic)
- ☐ Puncture
- ☐ Radiation Effects
- ☐ Strain/Sprain
- ☐ Tendonitits
- ☐ Wrist Pain

Part of Body Injured

- ☐ Abdomen
- ☐ Ankle(s)
- ☐ Arms (Multiple)
- ☐ Back
- ☐ Blood
- ☐ Body System
- ☐ Buttocks
- ☐ Chest/Ribs
- ☐ Ear(s)
- ☐ Elbow(s)
- ☐ Eye(s)
- ☐ Face
- ☐ Finger(s)
- ☐ Foot/Feet
- ☐ Hand(s)
- ☐ Head
- ☐ Hip(s)
- ☐ Kidney
- ☐ Knee(s)
- ☐ Leg(s)
- ☐ Liver
- ☐ Lower (arms)
- ☐ Lower (legs)
- ☐ Lung
- ☐ Mind
- ☐ Multiple (Specify)

  _____
- ☐ Neck
- ☐ Nervous System
- ☐ Nose
- ☐ Other (Specify)

  _____
- ☐ Reproductive System
- ☐ Shoulder(s)
- ☐ Throat
- ☐ Toe(s)
- ☐ Upper Arm(s)
- ☐ Upper Leg(s)
- ☐ Wrist(s)

Nature of Injury

- ☐ Absorption
- ☐ Bite/Sting/Scratch
- ☐ Cardio-Vascular/Respiratory System Failure
- ☐ Caught In or Between
- ☐ Fall (From Elevation)
- ☐ Fall (Same Level)
- ☐ Ingestion
- ☐ Inhalation
- ☐ Lifting
- ☐ Mental Stress
- ☐ Motor Vehicle Accident
- ☐ Multiple (Specify)

  _____
- ☐ Other (Specify)

  _____
- ☐ Overexertion
- ☐ Repeated Motion/Pressure
- ☐ Rubbed/Abraded
- ☐ Shock
- ☐ Struck Against
- ☐ Struck By
- ☐ Work Place Violence

Initial Diagnosis/Treatment Date: _____

Type of Treatment

- ☐ Admission to hospital/medical facility
- ☐ Application of bandages
- ☐ Cold/Heat Compression/Multiple Treatment
- ☐ Cold/Heat Compression/One Treatment
- ☐ First Degree Burn Treatment
- ☐ Heat Therapy/Multiple treatment
- ☐ Multiple (Specify)

  _____
- ☐ Heat Therapy/One Treatment
- ☐ Non-Prescriptive medicine
- ☐ None
- ☐ Observation
- ☐ Other (Specify)

  _____
- ☐ Prescription- Multiple dose
- ☐ Prescription- Single dose
- ☐ Removal of foreign bodies
- ☐ Skin Removal
- ☐ Soaking therapy- Multiple Treatment
- ☐ Soaking Therapy- One Treatment
- ☐ Stitches/Sutures
- ☐ Tetanus
- ☐ Treatment for infection
- ☐ Treatment of 2nd /3rd degree burns
- ☐ Use of Antiseptics – multiple treatment
- ☐ Use of Antiseptics – single treatment
- ☐ Whirlpool bath therapy/multiple treatment
- ☐ Whirlpool therapy/single treatment
- ☐ X-rays negative
- ☐ X-rays positive/treatment of fracture

Number of days doctor required employee to be off work: _____

Number of days doctor restricted employee's work activity: _____
Equipment Malfunction : Yes ☐ No ☐ Activity was a Routine Task: Yes ☐ No ☐
Describe how you may have prevented this injury: _____
_____

Physician Information
Name: _____
Address: _____
City: _____
Zip Code: _____
Phone: _____

Hospital Information
Name: _____
Address: _____
City: _____
Zip Code: _____
Phone: _____

Property Damage (Complete for Property Damage incidents only)

Property Damaged: _____ Property Owner: _____
Damage Description: _____
Estimated Amount: $ _____

Spill or Release (Complete for Spill/Release incidents only)

Substance (attach MSDS): _____ Estimated Quantity: _____
Facility Name, Address, Phone No.: _____
Did the spill/release move off the property where work was performed?: _____
Spill/Release From: _____ Spill/Release To: _____

Environmental/Permit Issue (Complete for Environmental/Permit Issue incidents only)

Describe Environmental or Permit Issue: _____
Permit Type: _____
Permitted Level or Criteria (e.g., discharge limit): _____
Permit Name and Number (e.g., NPDES No. ST1234): _____
Substance and Estimated Quantity: _____
Duration of Permit Exceedence: _____

Verbal Notification (Complete for all incident types)(Provide names, dates and times)

CH2M HILL Personnel Notified: _____
Client Notified: _____

Witnesses (Complete for all incident types)

Witness Information (First Witness)
Name: _____
Employee Number (CH2M HILL):_____
Address: _____
City: _____
Zip Code:_____
Phone: _____

Witness Information (Second Witness)
Name: _____
Employee Number (CH2M HILL: _____
Address: _____
City: _____
Zip Code:_____
Phone :_____

Additional Comments:
_____
_____

NEAR LOSS INVESTIGATION FORM

Employer Information

Company Name:

_____

Project Name: _____ Project Number: _____

Project Location: _____

CHIL Project? Yes ☐ No ☐

Task Location: _____

Job Assignment: _____ Business Group: _____

Preparer's Name: _____ Preparer's Employee Number: _____

Near Loss Incident Specific Information

Date of Incident: _____ Time of Incident: _____ a.m./p.m.

Location of incident:

☐Company premises ☐Field ☐In Transit ☐Other:_____

Address where the incident occurred:

_____

Equipment Malfunction : Yes ☐ No ☐ Activity was a Routine Task: Yes ☐ No ☐

Describe any property damage: _____

Specific activity the employee was engaged in when the incident occurred:

_____

____

_____

____

All equipment, materials, or chemicals the employee was using when the incident occurred:

_____

____

_____

____

Describe the specific incident and how it occurred:

_____

____

_____

_____

_____

Describe how this incident may have been prevented:

_____
_____
_____

Contributing Factors (Describe in detail why incident occurred):

_____
_____
_____

Date employer notified of incident: _____ To whom reported: _____

NEAR LOSS INVESTIGATION FORM

Witness Information (First Witness)

Name: _____

Employee Number (for CH2M HILL employees):_____

Address: _____

City: _____

Zip Code : _____

Phone: _____

Witness Information (Second Witness)

Name: _____

Employee Number (for CH2M HILL employees): _____

Address: _____

City: _____

Zip Code: _____

Phone : _____

Additional information or comments:_____

_____

_____

_____

Attachment 7

Applicable Material Safety Data Sheets
(available onsite)

Appendix C

Submittal Register and Testing Plan and Log

Contract Number: N62467-01-D-0331		CTO No.: 0085			CTO Title: NAS Pensacola Sherman Field FFF UST 24 Site Assessment Work Pla					Location: NAS Pensacola, Pensacola, Florida				Contractor: CH2M HILL Constructors, Inc.		
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Spec Section	Item Description	Para. Number	Approving Authority	Other Reviewers	Submittal Number	Scheduled Submission Date	CCI Review Date	CCI Disposition	CCI Transmit Date	QC Admin Received Date	QC Disposition	QC Admin Transmit Date	Contracting Officer Received	Contracting Officer Disposition	Contracting Officer Return	Remarks
	Records															
	Free Produc Measurement, Groundwater Elevation		CH2M HILL													

Testing Plan and Log

CH2M HILL Constructors, Inc.

Contract Number: N62467-01-D-0331		CTO No.: 0085		CTO Title: NAS Pensacola Sherman Field FFF UST 24 SA WP				Location: Pensacola, FL		
A	B	C	D	E	F	G	H	I	J	K
Spec Section and Paragraph	Test Required	Proposed Lab	Sampled By	Tested By	Test Location	Frequency	Date Test Made	Test Results	Date Results Forwarded	Remarks
Free Product and Groundwater	Elevation Measurements				Measurements from groundwater monitoring wells	Once				
Groundwater	Sampling				Monitoring Wells, Table 2-2	Once				

Appendix D

Project QC Manager Appointing Letter

CH2M HILL
Northpark 400
1000 Abernathy Road
Suite 1600
Atlanta, GA 30328
Tel 770.604.9095
Fax 770.604.9282

June 26, 2008

Ms. Phyllis Zerangue
CH2M HILL, Inc.
1766 Sea Lark Lane
Navarre, Florida 32566-7472

RE: Contract No. N62467-01-D-0331
Contract Task Order No. 0085
Naval Air Station (NAS) Pensacola – Pensacola, Florida
Project Quality Control Manager Letter of Appointment

Dear Ms. Zerangue:

Herein describes the responsibilities and authority delegated to you in your capacity as the Project QC Manager at NAS Pensacola, Contract Task Order (CTO) No. 0085 under RAC Contract No. N62467-01-D-0331.

In this position, you assist and represent the Program QC Manager in continued implementation and enforcement of the Project QC Plans. Your primary role is to ensure all requirements of the contract are met. Consistent with this responsibility, you will: (i) implement the QC program as described in the Navy RAC contract; (ii) manage the site-specific QC requirements in accordance with the Project QC Plans; (iii) attend the coordination and mutual understanding meeting; (iv) conduct QC meetings; (v) oversee implementation of the three phases of control; (vi) perform submittal review and approval; (vii) ensure testing is performed; (viii) prepare QC certifications and documentation required in the Navy RAC Contract; and, (ix) furnish a Completion Certificate to the Contracting Officer or designated representative, upon completion of work under a contract task order , attesting that "the work has been completed, inspected, and tested, and is in compliance with the contract."

Your responsibilities further include identifying and reporting quality problems, rejecting nonconforming materials, initiating corrective actions, and recommending solutions for nonconforming activities.

You have the authority to control or stop further processing, delivery, or installation activities until satisfactory disposition and implementation of corrective actions are achieved. You have the authority to direct the correction of non-conforming work. All work requiring corrective action will be documented on daily reports, and, in the event non-conforming work is not immediately corrected you are required to submit a non-conformance report to the PM and copy the Program QC Manager. A status log will be kept of all non-conforming work. You shall immediately notify the Program QC Manager in the event of any stop work order.

It is imperative that you comply with all terms of the basic contract. In particular, Section C, Paragraph 6.5.2, which states:

> *"No work or testing may be performed unless the QC Program Manager or Project QC Manager is on the work site."*

In the event that you are not able to be at the work site when work or testing is to be performed, it is your responsibility to inform the Program QC Manager and Project Manager, in advance, so that other arrangements can be made.

Further, if you are requested to perform the duties of the Site Supervisor, it is your responsibility to inform the Program QC Manager so that approval can be obtained in advance from the Contracting Officer or designated representative, in accordance with Section C Paragraph 6.6.2.1 of the contract.

You are a key member of the Project Manager's team. You ensure that work meets the specific requirements and intent of the work plan, the Navy's scope of work and the basic contract. Should you have any questions regarding this role, you should immediately contact the Program QC Manager, Theresa Rojas. Your day-to-day activities on the site should be coordinated with all site personnel and the Project Manager. In event of any deficient items, the Superintendent and Project Manager should be advised immediately so they have opportunity to remedy the situation.

Sincerely,

CH2M HILL Constructors, Inc.

Michael Halil
Deputy Program Manager

cc: Project File No. 371255